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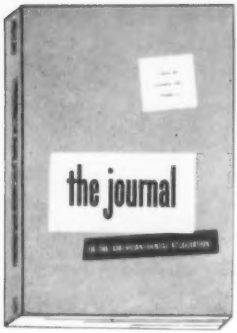

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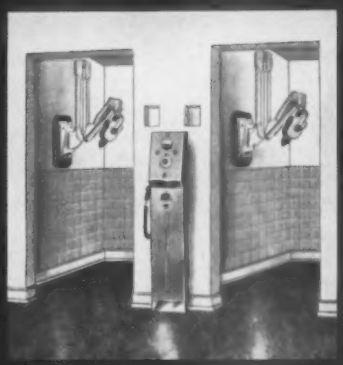

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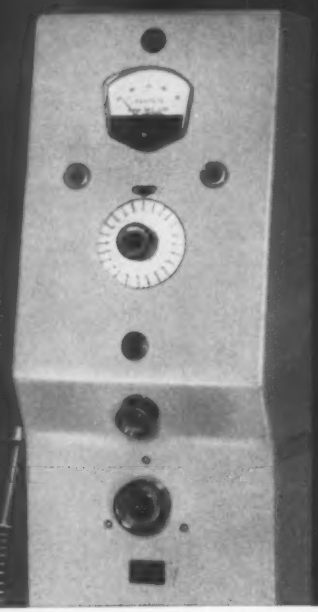

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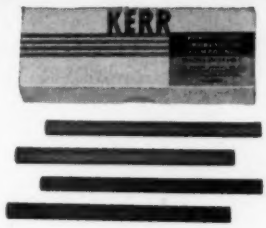

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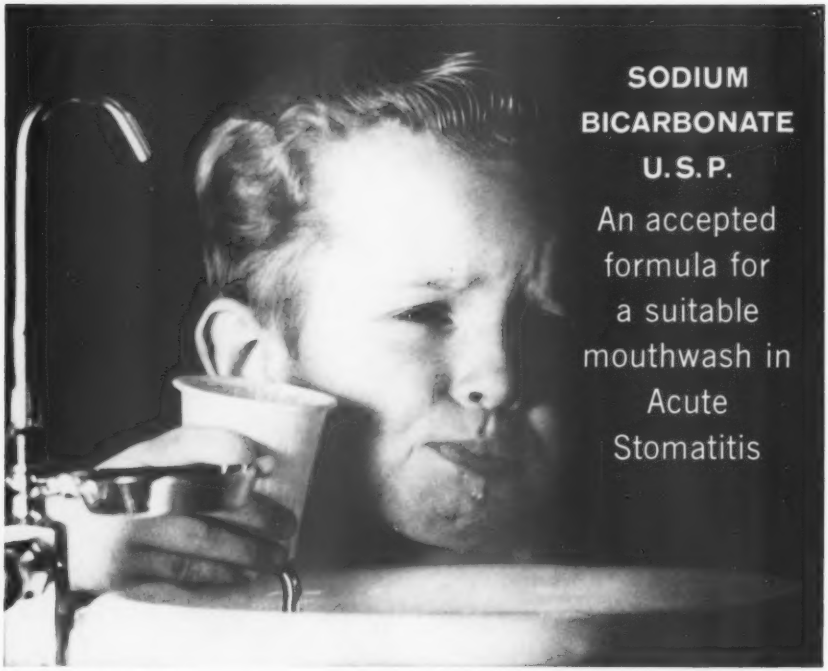

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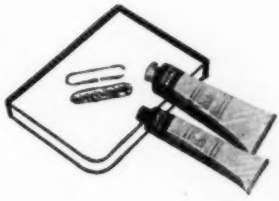

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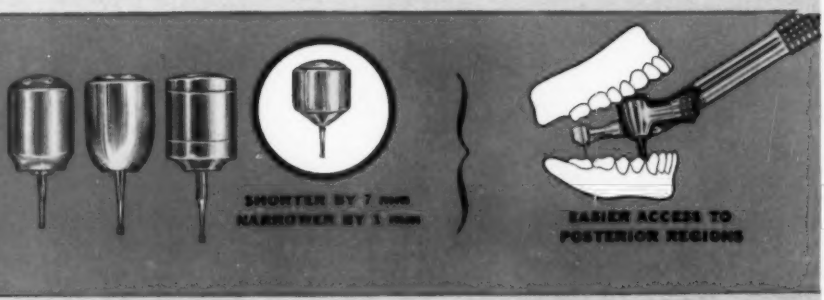

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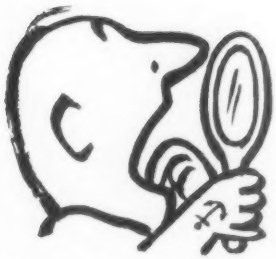

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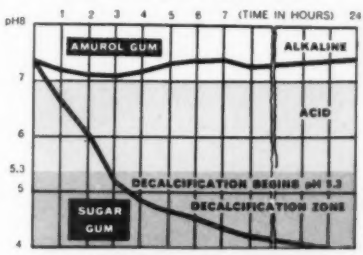

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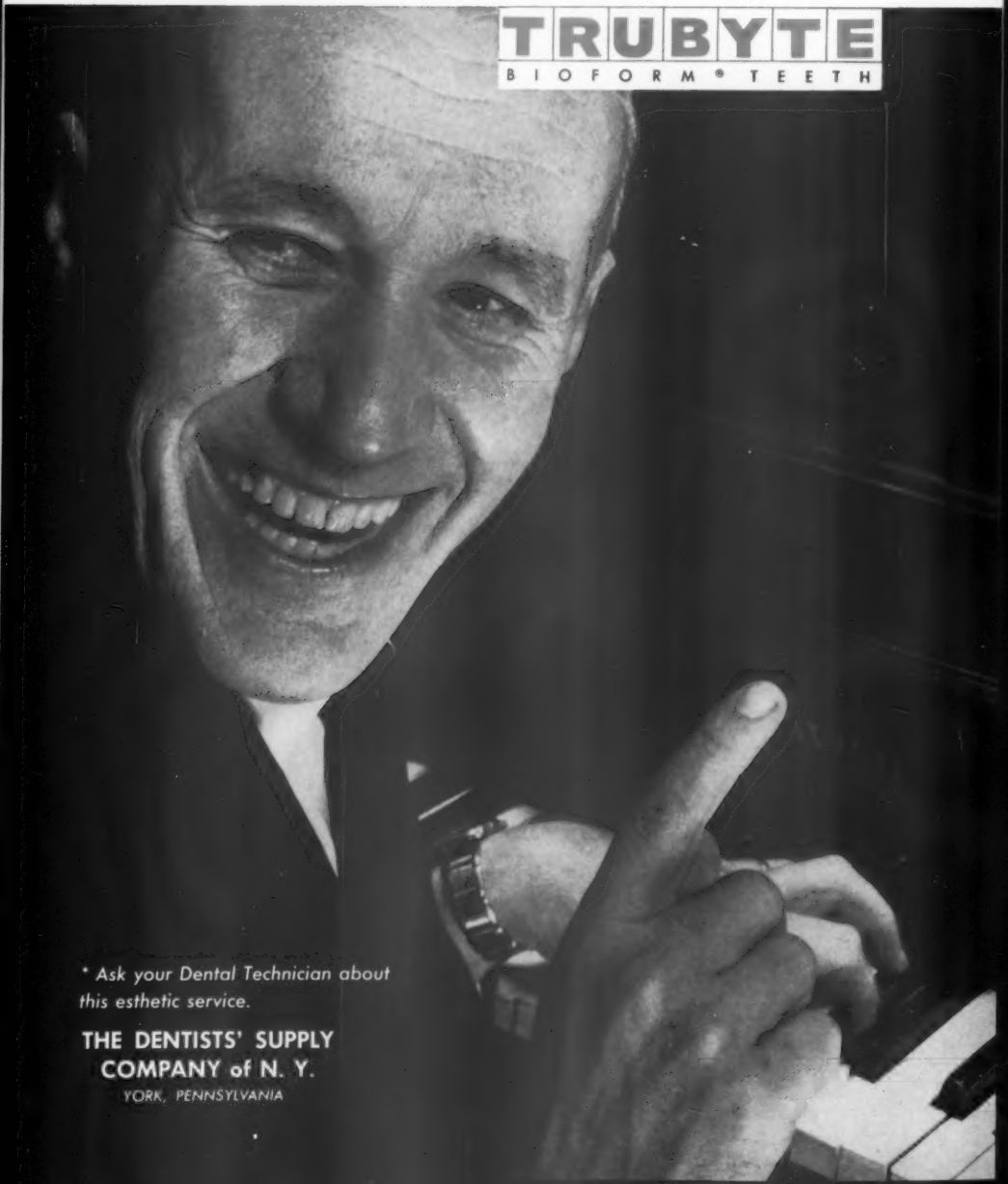

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Current treatment procedures for cleft lip and cleft palate rehabilitation: a symposium

Kenneth R. Bzoch, Ph.D., Chicago*

During the past 100 years, the dental profession in the United States has taken an active and often a leading role in developing procedures necessary to help patients with congenital clefts attain normal speech and appearance. Progress in the various medical, dental and speech specialties regularly represented on cleft palate teams of today has reached a level where we can now say that a cleft palate, per se, is no longer a sufficient reason for a child to have a speech defect at school age. The cure for cleft palate depends on a coordinated and properly timed treatment plan often carried out, of necessity, by several persons.

The following symposium is an attempt by some of the members of the Northwestern University Cleft Lip and Palate Institute to describe treatment concepts and practices evolved over some 13 years of combined treatment experience. Since the Institute was organized so as to give equal emphasis to service, teaching and research, the contributors not only have examined and made recommendations for all patients but, in most instances, have carried out or closely supervised their part of the treatment under the watchful and sometimes critical eye of their colleagues.

We hope through this series of papers to present for those dentists who have recently become associated with one of the many newly formed cleft palate teams our philosophy of patient-centered treatment planning, which includes a selective approach to surgical management, the elective use of the prosthetic speech appliance, and the use of coordinated and sometimes combined surgical, prosthetic and orthodontic treatment. Additionally, we hope to show the general dental practitioner the importance of his services to the cleft palate patient.

*Assistant professor of speech pathology and administrator, Northwestern University Cleft Lip and Palate Institute, Chicago, and speech consultant, Children's Center, St. Francis Hospital, Evanston.

Clinical appraisal of cleft palate rehabilitation problems

Kenneth R. Bzoch, Ph.D., Chicago*

The Northwestern University Cleft Lip and Palate Institute has adopted a modification of the classification system of Veau, the new system listing four major types of clefts plus a subgroup of unusual types. Rehabilitation of the patient with a cleft involves the correction of problems relating to speech defects, deformities in appearance, feeding, chronic otological conditions and upper respiratory infections. The solution usually requires the cooperation of all members of the cleft palate team, including the family dentist.

Cleft lip and cleft palate are two forms of congenital anomalies which frequently occur together but which also may be found singly. The area of the incisive foramen and not the alveolar ridge appears to be the true point of distinction between cleft lip (clefts of the primary palate) and cleft palate (clefts of the secondary palate).[1] This distinction is useful for the purpose of studies in etiology since the primary palate, which includes the lip with its prolabium, and the entire premaxilla, is formed between four and seven weeks after conception through mesodermal development. The secondary palate, which includes the hard and soft palate posterior to the incisive foramen, is formed between 7 and 12 weeks by the fusing of lateral palatal processes. For the clinical appraisal of surgical, dental, and speech treatment procedures, however, a more detailed descriptive classification is helpful.

In order to study the effects of treatment on growth, speech, appearance and psychosocial adjustment of cleft palate patients, objective serial records in the form of cephalometric roentgenograms, casts, dental roentgenograms, photographs and tape recordings, speech tests, hearing tests and psychometrics are routinely taken at the Northwestern University Cleft Lip and Palate Institute and at other cleft palate centers. The past interpretation of such records, when these data were grouped together under the common heading of cleft palate, often has been misleading. Clinical experience has shown that the extent of the original cleft and the detailed appraisal of related structure and physiology give the simplest and most accurate index for the prognostication of future rehabilitation problems and the selection of rehabilitation technics. For this reason, a modification of the simple classification system of Veau[2] has been adopted at the Northwestern University Cleft Lip and Palate Institute and will be referred to in the following papers.

CLASSIFICATION OF CLEFTS

There are four major types of clefts in this classification system and a subgroup of unusual types.

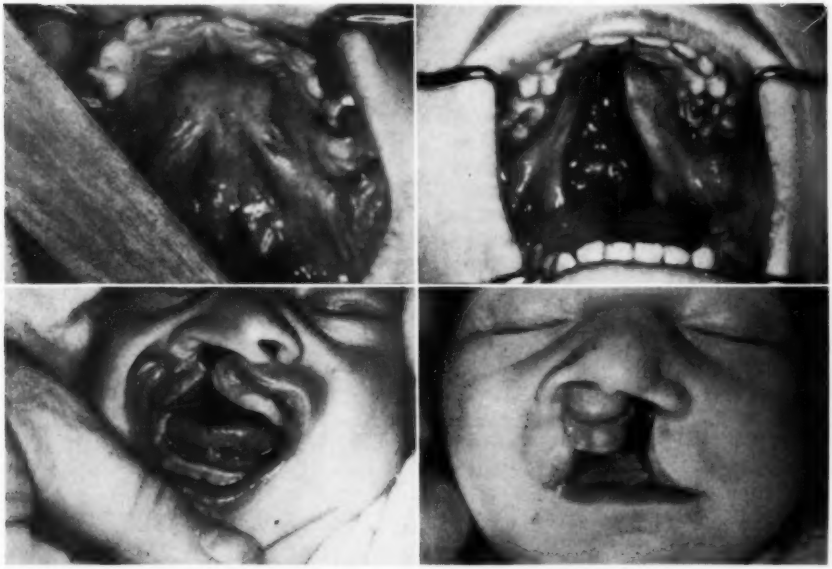
Class I includes all cleft malformations which involve only the soft palate.

Class II clefts involve all of the soft palate and some part of the hard palate up to the incisive foramen. These types of clefts frequently show deficiency of tissue before surgical closure, and research[3] indicates they often result in defective speech. Too often the significance of this type of cleft is minimized to the parents.

Class III clefts involve a midline cleft through the hard and soft palates plus a complete or incomplete fissure through the alveolar ridge to either the left or the right of the premaxillary segment. This is the most frequent form of cleft lip and cleft palate found in the larger survey studies.[4] Special prosthetic and orthodontic treatment is usually required in the treatment of this type of cleft. The complete unilateral cleft usually shows the least deficiency of tissue of all the more frequent types.

Class IV clefts involve all of the hard and soft palate and a fissure to both the right and the left of the premaxilla. This malformation usually isolates the premaxilla, which may be greatly underdeveloped and malpositioned. Class III and Class IV clefts usually are accompanied by a cleft of the actual lip structure on the side or sides of the alveolar cleft. Such lip clefts are designated as either complete or incomplete and as right, left, or midline in the Northwestern system whenever they occur with any type of cleft. Each of these four major types of cleft malformations is shown in the illustration.

Unusual congenital palate conditions



Four major types of cleft palate conditions. Above left: Class I cleft—soft palate only. Above right: Class II cleft—soft and hard palate. Below left: Class II cleft—unilateral complete. Below right: Class IV cleft—bilateral complete

not fitting into this classification system are classified in a subgroup as either (1) clefts of the primary palate only, (2) submucous clefts, (3) congenital palatal insufficiencies, or (4) occult clefts.

After classification of the cleft, further description is based on objective measurements of the width and extent of clefts and on a functional evaluation of the palatal musculature. The latter is a clinical evaluation of the extent of muscle activity of the levator palati, the palatopharyngeus, the salpingopharyngeus, and the sphincter ring of the superior constrictor muscle. The function of each is judged during gagging and during phonation as either extensive, good, fair, trace, or none.

REHABILITATION PROBLEMS

Authorities are generally agreed that the associated speech defect is usually the major handicap resultant from cleft palate. Experience at the Institute in coordinated and complete treatment of cleft palate patients suggests that there is no longer any clinical reason for children with cleft palate, even those with an extensive Class IV cleft, to grow up with a speech handicap. Through proper surgical treatment and early orthodontic correction, growth disturbances and malocclusions which might have been significant hazards to normal speech can be avoided or corrected early. Through the selection of a surgical technic based on the type of cleft and the growth pattern of the individual, surgical reconstruction of the palate usually can establish the competency of the velopharyngeal valve which research has shown is the major structural hazard to normal speech. This can most often be accomplished without resorting to the pharyngeal flap procedure. In instances where the tissue is too scarce to merit a recommendation for surgery or where surgery has not resulted in a sufficient velopharyngeal valve, the prosthetic speech appliance can establish an adequate mechanism for speech.[5] Patients with habits of misarticulation of the speech sounds, which constitute the greatest difference in the speech of many persons with a cleft palate, can be retrained by a speech therapist, even before school age is reached.

However, deformities in appearance also can be of major consequence in cleft lip or cleft palate patients. Persons born with a Class III or Class IV cleft or with any form of isolated cleft of the primary palate may have a deformity ranging from a hardly noticeable scar on the upper lip to a grossly deformed and "dished-in" middle third of the face with prognathic jaw, redundant lower lip, and distorted nasal structures. Feeding problems, chronic otological problems, and upper respiratory infections are often additional difficulties. The significance of these problems often lies in their effect on parental acceptance of the handicapped child and on the child's own psychosocial adjustment. The early correction of the basic problems of speech, growth and appearance and the supervision of the other related organic problems can and most often do lead to the complete rehabilitation of cleft palate patients. The solution to these problems usually requires the close cooperation of all members of the cleft palate team which includes, in a very real sense, the family dentist.

*Assistant professor of speech pathology and administrator, Northwestern University Cleft Lip and Palate Institute, Chicago, and speech consultant, Children's Center, St. Francis Hospital, Evanston.

1. Stark, R. B., and Ehrmann, N. A. Development of the center of the face with particular reference to surgical correction of bilateral cleft lip. Plast. & Reconstr. Surg. 21:177 March 1958.

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3. Bzoch, K. R. Investigation of the speech of preschool cleft palate children. Ph.D. thesis, Northwestern University School of Speech, 1956.

4. Fogh-Andersen, Poul. Inheritance of harelip and cleft palate. Copenhagen, Nyt nordisk forlag, 1942.

5. Rosen, M. S., and Bzoch, K. R. Prosthetic speech appliance in rehabilitation of patients with cleft palate. J.A.D.A. 57:203 Aug. 1958.

Primary surgical correction of congenital clefts of the lip and palate

Frank W. Pirruccello, M.D., Evanston, Ill.

No one procedure for surgical closure is adequate for all types of palatal clefts. The use of prosthetics is elective in instances of gross tissue deficiency. Surgical treatment of cleft palate always is the method of choice whenever its goals can be reasonably attained. The surgical method selected depends largely on the extent of the cleft and on anatomic and physiologic details of the related parts. Two case reports illustrate some of the problems encountered in the surgical management of cleft palates.

Modern surgical treatment procedures for the correction of cleft lip and cleft palate are, for the most part, refinements of the technics developed by pioneer surgeons in this field. Although there are isolated reports of successful surgical technics for the closure of clefts as early as the seventeenth century, the procedures in use today are generally attributed to Warren[1] (1843), von Longenbeck[2] (1861), Passavant[3] (1865) and Dorrance[4] (1925). The mechanical approach utilizing maxillary compression as advocated by Brophy[5] (1923) has been generally abandoned since the reports of its effects on growth of the maxilla by Brodie[6] (1941) and by Graber[7] (1949).

SELECTIVE APPROACH TO SURGERY

Today, the plastic surgeon has available a number of tested operations and technics which, if utilized properly, can result in satisfactory reconstruction of clefts in the great majority of instances, with a resultant adequate mechanism for normal speech and without the former detrimental effect on the growth of the upper jaw. Years of postoperative studies at the Cleft Lip and Palate Institute of Northwestern University suggest that no one procedure for surgical closure is adequate for all of the types of malformations generally referred to as cleft palate. Careful and conservative procedures utilizing the basic technics described by the surgeons listed, but with avoidance of bone fracture and of disruption of nerve or blood supply, lead to satisfactory correction from the primary closure of the malformation for most of the patients.

It should be pointed out, however, that in approximately 10 to 15 per cent of patients, there is a congenital deficiency of tissue to the extent that primary closure may still leave some degree of velopharyngeal insufficiency for speech. In

Fig. 1 • Congenital cleft with insufficient tissue for satisfactory surgical reconstruction

many of these patients, closure is advocated by the cleft palate team with a guarded prognosis. The parents are informed that the operation will improve the infant's physiology for normal speech and may prove adequate, but that a further revision of the palate may be necessary at a later date. The technics of relaxing incisions, or incorporation of some length of the posterior pillars as advocated by Passavant, can lead to adequacy of the velar valve for many of these patients. In selected instances a two-stage push-back operation where the superior aspect of the palate is grafted to preclude cicatricial shortening can salvage the speech mechanism of a child with short palatal tags. If postoperative speech and cephalometric studies show inadequate structure for normal speech, a temporary speech appliance can be used until growth of the maxilla and the nasopharynx has progressed to a point where a secondary palatal operation can be advised.

The selective approach to surgical management includes the elective use of prosthetics in instances where there is gross tissue deficiency. Although it is possible to close any congenital cleft through surgery, long-term studies show that it is not always advisable. The family history of one of the patients at the Institute illustrates the reason for this more conservative approach. Figure 1 shows an intraoral view of a six year old boy who was brought to the Institute from another country for treatment. His particular pedigree of cleft is associated with lip pits and probably should be treated as a dominant rather than a recessive genetic entity. The cleft measured approximately 12 mm. at the uvular border and the distance from the soft palate tags to the posterior pharyngeal wall was 2.5 cm. The boy's sister, who was born with a very similar cleft, had had surgery performed before coming to the Institute. Closure of the cleft was successful, but she still had a totally inadequate structure for speech because of the extreme shortness of the soft palate. The boy's father also had a similar cleft. Five separate attempts at surgical reconstruction of the palate, including a broad pharyngeal flap, had failed to provide him with an adequate structure for speech. Since prosthetic treatment offers the simplest and longest tested method of providing for missing tissue, we feel even today that some clefts are more satisfactorily corrected without primary surgical closure.

SURGICAL TREATMENT PROCEDURES

Despite certain reservations regarding particular types of clefts, surgical treatment is always the method of choice for treatment of a cleft palate whenever its goals can be reasonably attained. The main goal of primary closure of the palate is to reconstruct the cleft regions so as to produce a competent velopharyngeal valve for speech. A second, and equally important goal, is to do this without disturbing the normal anatomic relationships of the structures surrounding the oral and nasal cavities. Esthetic values are almost always involved because of lack of sufficient tissue in the underlying structures. In modern surgical treatment, all tissues are respected in dis-

section and in suturing so that irreplaceable parts and growth potentials will not be lost.

TIMING OF SURGERY

With the selective approach to palatal surgery, there is no set time for primary closure. Lip surgery, however, is regularly performed as soon as the infant has regained his birth weight. Early closure of a cleft lip is possible today because operative risk in the hands of a competent anesthesiologist and plastic surgeon is no longer a necessary consideration. Clinical studies show that early lip closure affects favorably the narrowing of the fissure in the hard and soft palate. Early closure of cleft lip also helps a family to adjust to and accept the child with a cleft palate.

At present, surgical closure of a cleft palate is being carried out when the patients are between one and five years of age. The type of cleft palate and the morphology of the related parts, naturally, are determining factors. Class I and Class II clefts, with sufficiency of tissue, often can be closed when the infants are between one year and 18 months of age without detrimental effects on growth or on the occlusion. In such instances, surgery can proceed after the deciduous dental arch has erupted to support the buccal segments. In other instances, surgery is delayed until clinical and cephalometric studies show that there is no longer any advantage to be gained from growth changes.

TYPES OF SURGERY

The method selected for surgical closure of a given congenital cleft is dependent largely on the extent of the cleft and on the details of the anatomy and physiology of the related parts. A modification of the Hagedorn technic is used most often in lip surgery for both unilateral and bilateral cleft lip. This method has been used for many years and can be expected to give a cosmetically and functionally satisfactory result on a long-term basis.

Clefts of the palate may be corrected in a variety of ways. Class I and Class II clefts often are repaired through a simple freshening and direct approximation and suturing of the palatal shelves in a manner similar to the early Warren or von Longenbeck operations or following the conservative approach recommended by Slaughter.[5] These clefts, which involve only the palate, may be relatively easy to correct or they may present a very difficult and complicated problem for the surgeon. The osseous defect usually extends anteriorly to the visible cleft and may extend to the alveolar ridge leaving relatively little tissue for closure.

REPORT OF CASES

Case 1 represents one of the more difficult instances of incomplete cleft palate. This young girl, who is now nine years of age, was brought to the Institute at the age of five with an unoperated Class II cleft involving about one third of the hard palate and all of the soft. The prognosis for surgical closure was very guarded because of the shortness of the palatal tags and the width of the cleft which measured 1.5 cm. at the uvular border. Surgical closure was recommended because of the very good action of the levator palati muscle, the sphyncter ring of the superior constrictor muscle and the salpingopharyngeus muscle. A single operation was performed shortly after the girl's fifth birthday. In this operation, relaxing incisions lingual to the upper molars were used and the mucosa was carefully undermined. The posterior pillars were incorporated into the palate for a distance of 5 mm. The palate remained closed and became very mobile shortly after closure. Articulation of the speech sounds previously was normal and the palatal reconstruction eliminated the problems of hypernasality and

nasal emission. The speech of this patient was tested by the speech pathologist and was found to be perfectly normal one month after closure. Figure 2 shows a recent tracing of a cephalometric headplate taken four years after surgery. Speech has remained normal. The tracing, taken from a roentgenographic exposure of the patient phonating the vowel "u" shows the continued adequacy of the velopharyngeal valve and the normal development of the maxilla. There is still some danger of velar inadequacy later in life with the recession of the adenoid mass. This patient will be studied regularly at yearly intervals to see if problems arise later. Experience leads us to believe that this girl's palate will be able to compensate for later growth changes and that speech will remain normal.

Closure of Class III and Class IV clefts usually involves selection between a greater number of technics. Closure is often effected through the approach of the von Longenbeck type utilized in Case 1. This is done without cutting the blood supply to this region when the mucoperiosteum is undermined and used for closure. Sometimes two operations are required to close the entire palate. In such instances the first closure is completed as far to the anterior as feasible to make possible adequate obturation of the remaining hard palate perforation. Later growth changes usually decrease the size of the hard palate perforation to make permanent closure through surgery possible.

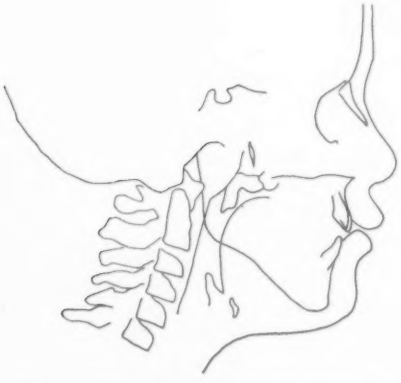

Fig. 2 • Cephalometric tracing confirming adequate velopharyngeal closure and growth after palatal surgery

In Case 2 an approach to the surgical management of a Class III cleft was used which is fairly typical. This white male infant, who is now four and one half years old, was referred to the Institute for management when he was 18 months old by the Division of Services for Crippled Children of the State of Illinois. When he was three weeks old, the infant's lip had been closed satisfactorily at the hospital in which he was born. The cleft palate team recommended surgical closure of the hard and soft palate since there were sufficient tissue and good muscle activity. The boy had delayed speech development so the mother was enrolled in the parents' class at the Institute to be instructed in methods of home speech training. After preliminary studies were completed, surgery was performed when the child was 24 months old. Incisions were made in the palate bilaterally at the edges of the cleft. The mucoperiosteum was then separated from the underlying bone. Bilateral relaxing incisions were made. An incision was made down each posterior pillar for about 3 mm. Complete closure was accomplished and there were no postsurgical complications. It is now two years after surgical closure. Clinical tests show that the velar valve is adequate and that speech therapy will not be needed. There was a slight collapse of the buccal segment which is scheduled to be corrected through first phase orthodontic treatment. Secondary cosmetic surgery on the lip and nose probably will be performed after growth of the maxilla is completed.

636 Church Street

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The speech pathologist of the rehabilitative team

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The results that a speech pathologist can obtain are limited by the oral structure. Particular training and experience are necessary to understand the cleft palate problem. The patient with a cleft palate should receive speech training as early as possible. The speech pathologist should recognize the crucial role of velopharyngeal valving in the production of speech.

The speech of cleft palate patients has two notable characteristics: (1) a disruption of the consonantal pattern, and (2) a distortion of the tonal quality, attributed to a larger than normal proportion of nasal resonance and emission of air. The consonants may be omitted or produced in a distorted manner, or replaced by a different sound if the patient finds it very difficult to make a particular sound. The unique vocal substitutions of cleft palate patients are the glottal stop used for plosive sounds ("k," "t," "d" and so forth) and the pharyngeal fricative used for the usual fricatives (s, sh and so forth). The result is an acoustic syndrome which often makes the cleft palate condition identifiable from the speech alone. Cleft palate speech cannot be distinguished, however, from the speech of persons who have inadequate velar functioning because of polio or other conditions affecting the pharyngeal region.

The tone of speech is generated in the larynx and modified as it passes through the supralaryngeal, pharyngeal, oral and nasal cavities. Each vowel and consonant has a characteristic acoustic pattern; and during the speaking act changes in cavity dimension, size of cavity aperture, the number of coupled cavities, and the tension of the cavity walls result in the repertoire of sounds making up a language. Particular sounds, specifically the plosive and fricative consonants, depend on breath pressure. The plosives are produced by the quick release of air dammed

up by the tongue or lips. The fricatives ("s," "sh," "f") are made by forcing air through narrow channels formed by precise adjustments of the lips or tongue. In continuous speech these sounds must follow in quick succession, many being produced in one tenth of one second. It is obvious that in evaluating the structures used in speaking one must consider factors which make these rapid and precise adjustments possible.

In continuous speech about 80 per cent of the consonants are made by the tongue contacting the upper alveolar arch. In these contacts the tongue makes either a complete seal or a partial seal with the gum line, directing the air or sound or both through a controlled aperture. One may say categorically that any irregularity in the arch is a hazard to speech. The tongue can make a seal quickly with a smooth arch line. An uneven surface which might result from malpositioned teeth, deformed teeth, edentulous spaces, or notching in the areas of cleft makes the rapid valving of the tongue difficult or even impossible.

Adequate space within the arch and palatal vault is important, since if the tongue makes unnecessary contacts with the oral cavity walls as it moves from one adjustment to another, speech is distorted. A lateral constriction of the maxillary arch is a proved hazard to good speech. An unusually high palatal vault has no handicapping effect, but a low vault is a serious threat. Mesially displaced teeth or internally rotated palatal segments present a problem since they limit the operating region for the tongue.

For a rule of thumb it may be stated that anything the dentist does to make the oral aspect of the alveolar arch as regular as possible will facilitate speech. Anything he does to give necessary vertical and lateral dimension to the vault will be helpful; at least, he can see that his appliances subtract as little as possible from the regularity and the dimensions of the oral structures.

The patient with a cleft palate should be given help as early as possible. A young child needs good speech for his personal, social and educational growth. Particular care should be taken to provide partial appliances to supply temporary teeth, even though they may be used for less than one year. In the region of the cleft, notching of the alveolar arch and edentate spaces make tongue activity very difficult. A small appliance filling the notch and supplying a tooth facilitates speaking and improves appearance.

Although the importance of the oral cavity to good speech cannot be questioned, the crucial part played by velopharyngeal valving must not be underestimated. The speech of persons who have clefts of the soft palate only, but with normal maxillary arches, is very little if any better than the speech of persons having complete bilateral clefts. On the other hand, persons having clefts of the anterior structures but not the soft palate usually have good speech. In assessing the speech potential of a person with a cleft palate, careful attention must be paid to the length and mobility of the soft palate, including muscle testing of each of the contributing muscles.

Too little attention has been paid to normal velar valving, an understanding of which is basic to the evaluation of a cleft palate patient. In this activity the position of the levator palati muscles is important. In the normal palate the inferior insertions of the levator muscles are readily apparent in the medial third of the palate during gagging. In the surgically repaired palate, which is usually shorter than the normal palate, the inferior insertions of these muscles are often relatively farther forward, placing a serious limitation on their function. It must be remembered that the functional length of the soft palate is the distance from the posterior surface of the hard palate to the inferior insertions of the levator muscles. This explains why some apparently short, surgically repaired soft pal-

ates serve speech better than others whose total lengths are greater.

In normal persons the direction of force of the levator muscles is superior and slightly posterior, but the pull is not sufficiently posterior to effect a contact with the posterior pharyngeal wall. The action of the levator muscles alone may be adequate to make closure in a young child, as they can effect a contact with the adenoid pad; but later with the atrophy of the pad and the downward growth of the palate the area of velar contact shifts to the posterior pharyngeal wall and the levator activity must be supplemented with the vector force of the palatopharyngeus muscle. In this combined activity the levator muscles supply a superior and slightly posterior force which combines with the inferior and posterior force of the palatopharyngeus muscles to produce a posterior vector force which brings the palate to the posterior pharyngeal wall. The contracting fibers of the salpingopharyngeus muscle reduce the lateral dimension of the velopharyngeal area, and the circular fibers of the superior pharyngeal constrictor muscle, which enter the soft palate at this level, possibly reduce the anteroposterior as well as the lateral dimension. The contribution of the sphincteric fibers of the superior constrictor muscle may be questionable, however, in rapid speaking.

The velar valving may be assessed in three ways: oral inspection, examination of sagittal roentgenograms, and functional tests. No one way alone is sufficient. Inspection of the oral aspect of the soft palate offers clues but no definite assurance of the contour of its nasal aspect. When sagittal roentgenograms are examined, the contour of the palate on a film exposed during inhalation is compared to the contour on films exposed during the production of the vowel u (boot) and the consonant s. Sagittal roentgenograms, however, do not reveal the activity of the lateral pharyngeal walls. In the final analysis, if there is no nasal escapage of air during the production of pressure sounds ("p," "t," "s," "ch" and so forth) or if the sustained vowels u (boot) and i (beet) do not show alteration in quality as the nostrils are alternately closed and released, velar functioning cannot be a serious problem for speech.

Although the role of the speech pathologist is primarily that of a teacher, the speech results are going to be limited by the structure. Optimal attainment is more apt to come from improving the structure than from good teaching alone. It is, therefore, essential that, without assuming any of the prerogatives of the surgeon or the dental specialist, the speech pathologist interpret his knowledge of the structure and function essential to supporting speech in these persons. This does not imply that any or every speech pathologist is equipped to render the best diagnostic and training services to the cleft palate patient. Just as the surgeon or the dentist needs particular training and experience to understand the cleft palate problem, the speech pathologist must recognize this special area of interest and not presume to be knowledgeable until he is fully qualified.

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Responsibility of the general practitioner to the cleft palate patient

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The general practitioner of dentistry should not hesitate to assume responsibility for maintaining in optimum health the teeth and supporting structures of the patient with a cleft palate. Lack of adequate dental care jeopardizes the balance of the treatment program. Special problems which may be encountered in treatment of the patient with a cleft palate include tautness of the obicularis oris muscle, nasal congestion, malalignment of teeth, supernumerary teeth and soft tissue disturbances. An understanding of growth and development is important. Each child must be considered as an individual.

It is apparent from the accompanying reports on the various facets of treatment for the cleft palate patient that it is only through the coordinated efforts of many that these patients can take their rightful place in our society. It would be most difficult if not impossible to determine which aspect of the total treatment is the most important to the patient, as each is dependent on the other for an optimal result. It is felt that all too frequently the general practitioner of dentistry does not fully appreciate his responsibility to this group of patients. The question might be asked: What is the responsibility of the family dentist to the cleft palate patient, and what are the special problems that may be encountered by the dentist in meeting this responsibility?

ROLE OF GENERAL PRACTITIONER

The general practitioner of dentistry should not be hesitant or reluctant to assume the responsibility of maintaining the teeth and supporting structures of the cleft palate patient in optimum health. Although restoring a first permanent molar to its normal contour and function may not appear to be as dramatic as a pharyngeal flap operation or correcting a cross-bite, it is in some instances equally important to the patient. Without adequate and proper dental care, the balance of the treatment program is in severe jeopardy; for illustration, the orthodontist is unable to carry out his program in establishing a normal occlusion, and the prosthodontist is not able to utilize adequately the members of the dentition to stabilize his speech appliance or other prosthetic appliances that may be indicated if the crucial teeth are lost through caries.

It is not uncommon to hear a parent

remark that he cannot find anyone in his immediate locality who will work on his child since the child has a cleft palate. Such a situation is indeed unfortunate; the parent must either neglect the child's dental care, or take the child many miles to an area where such services are available.

SPECIAL PROBLEMS

There are only a few special problems that might have to be taken into consideration in rendering dental care to a patient with a cleft palate. It will be the intent of the balance of this paper to discuss these special problems and their considerations.

Tautness of the Orbicularis Oris Muscle • In some instances, especially where the patient has had a bilateral cleft lip and palate surgically repaired, there may be a certain degree of tautness to the musculature around the opening to the oral cavity, which may lead the operator to believe that there will be inadequate access for performing restorative procedures. This usually is not the case. However, the lip often does not have the same degree of elasticity characteristic of a patient who has not had extensive surgical repair in this region. If the access to the region is not as adequate as desired, the operator is encouraged to employ a miniature sized mirror, contra-angle and rotary cutting instruments.

Nasal Congestion • Some of these patients, particularly children, who have varying degrees of chronic nasal congestion or a deviated nasal septum, or both, may have a fear of being unable to breathe while having restorative dental work performed in their mouth. The dentist should check the adequacy of nasal breathing, and if it is found sufficient he should reassure the patient. This situation has been observed on several occasions when employing the rubber dam for the first time in the placement of a restoration.

Malalignment of the Teeth • One or several teeth may be in malalignment in the dental arch. As a result of this malpositioning of the teeth, atypical caries frequently is present. In restoration of such a tooth, special care should be taken to extend the margins of the restoration into self-cleansing areas. It is not uncommon to see a tooth rotated 45 to 90 degrees in the dental arch. If such a situation exists, the same basic rule of cavity preparation prevails except that the proximal box portion of the cavity preparation would be on the buccal or lingual aspect of the tooth instead of the mesial or distal, depending on the particular case.

Anomalies Encountered • The dental anomalies frequently seen in the cleft palate patient are: (1) supernumerary teeth, (2) hypoplastic teeth, and (3) congenital absence of teeth. Stafne[1] reported that when 48,850 patients were examined, 441 had one or more supernumerary teeth. Thus it might be expected that approximately 1 out of 110 normal persons has a supernumerary tooth. Byrd,[2] who examined 2,835 children, found that only 15 had supernumerary teeth. Mackley[3] in surveying the incidence of supernumerary teeth in the cleft palate patient found the presence of supernumerary teeth to be more prevalent than previously indicated for normal patients. It was his observation on examination of 119 cleft palate patients at Northwestern University Cleft Palate Institute that 21 per cent of all the patients had one or more supernumerary teeth present. Fifty-nine patients (49.6 per cent) had congenitally missing teeth.

There are varying opinions regarding treatment when a patient has a supernumerary tooth. Some believe that the

tooth should be removed at the earliest convenience, and others, such as McBride,[4] believe that a supernumerary tooth in the deciduous dentition, if it assumes a normal position in the dental arch, may be allowed to remain until the normal time of exfoliation. If it is not exfoliated in a normal manner, it should be extracted when its neighbor is lost. A supernumerary tooth in the permanent dentition usually is removed as early as it is convenient. Care must be exercised in its removal so as not to injure the neighboring tooth.

Dystrophy of a tooth (hypoplasia) is due to some disturbance during its period of formation. In placement of a restoration in such a tooth, a more radical operative approach at the time of placement of a restoration may well be the most conservative in a long-range program. It is usually wise to tip or shoe the cusps of such posterior teeth, as the hypocalcified tooth structure will not withstand the normal stresses of mastication.

When teeth are congenitally missing or lost prematurely, thought should be given to the necessity of space maintenance or allowing the space to close by itself or by orthodontic assistance. In determination of the need of space maintenance, the following factors should be considered: (1) the dental age of the patient, (2) the region from which the tooth is missing, (3) the occlusion, (4) the type of bone present, and (5) hereditary factors.

Soft Tissue Disturbances • The incidence of periodontal disturbances is perhaps greater in the patient with a cleft palate than in the one who does not have this deformity. There are several influencing factors that might contribute to periodontal involvement. A few of these are: (1) irregularity or malalignment of the tooth or teeth in the dental arch, (2) mouth breathing in a patient who has inadequate nasal passages, and (3) inadequate function of supporting structures.

Preparation of Abutment Teeth for Appliances • The dentist may be called on to prepare the maxillary dentition to receive a prosthesis, such as a speech appliance, obturator, or a modification of a Hawley appliance. The use of the preformed stainless steel crown for abutment teeth has proved satisfactory when cast gold crowns were not employed. These crowns are adapted in such manner that they extend beneath the gingival tissue, and they are closely adapted to the tooth. Lack of close adaptation may initiate gingival irritation of varying degrees. When clasps are to be placed around the abutment tooth, additional retention is obtained by soldering buccal prominences on the gold or stainless steel crown. If a complete denture is to be placed over the maxillary dentition to restore lack of vertical dimension, it may be wise to crown all the maxillary teeth. It has been observed that failure to do so often results in a high incidence of caries in the teeth that are covered by the prosthesis.

Dental Roentgenograms • Taking dental roentgenograms of the cleft palate patient occasionally deserves special consideration because of malpositioning of some members of the maxillary dentition. The roentgen rays should bisect the angle formed by the long axis of the tooth and the film. If this technic is followed in preference to orienting the patient in the chair so that the occlusal surfaces of the teeth are parallel to the floor, much elongation and shortening of images will be avoided. The use of extra-fast film is also recommended in taking dental roentgenograms.

Use of Local Anesthesia • Local anesthesia should be utilized in performing restorative services for the cleft palate patient. With the aid of local anesthesia,

dental procedures can be rendered with a minimum amount of discomfort to the patient. Special consideration should be given to the use of local anesthesia for the cleft palate patient for procedures in the upper anterior teeth. It has been suggested by Cook,[5] and Phillips and Maxmen,[6] that there might be a supplementary branch of the nasopalatine nerve. When there is a bilateral cleft lip and palate, such a nerve would be the only logical source of innervation to the upper anterior teeth in the mobile premaxilla.

With proper introduction of the child to local anesthesia, little difficulty is encountered in giving an injection to the child. Topical anesthetic agents may be employed to obtund the pain at the site of injection.

Cavity Preparation and Placement of the Restoration • Some of the frequent causes for failure of restorations in the deciduous and young permanent dentition are: (1) insufficient width of the isthmus of the restoration, (2) failure to round the axiopulpal line angle, (3) improper outline form, (4) inadequate extension for prevention, (5) failure of the cavosurface angle to approximate 90 degrees, (6) incorrect matrix adaptation, and (7) improper carving of the restoration.

Perhaps one of the chief causes for failure of a class II type restoration in a deciduous tooth is inadequate width of the isthmus. The isthmus ideally should be one-half the intercuspal dimension of the tooth. The strength of an amalgam restoration is dependent on its bulk, and because of the relative thinness of the enamel and dentin of a deciduous tooth, the bulk of amalgam must be obtained in a buccolingual direction. The outline form of the cavity preparation should include all pits and fissures, and the cavity should be extended into self-cleansing areas where there will be a minimum opportunity for recurrence of caries.

The axiopulpal line angle should be rounded to reduce the shearing stress to the restoration. The cavosurface angle should approximate 90 degrees to give the amalgam restoration maximum bulk at the margins of the restoration. The matrix should be well-adapted and a wedge placed to eliminate gingival excess and overhangs.

The amalgam should be placed in a cavity free from salivary contamination. This can be accomplished readily with the aid of the rubber dam. Care must be exerted in condensing the amalgam properly. After adequate condensation, the restoration should be carved to duplicate the former contours of the tooth. With young children it is essential to carve the restoration in such a manner that no interceptive or deflective contacts will be present. If such contacts exist, the restoration is frequently fractured before the patient is dismissed.

Establishment of Rapport Between Patient and Dentist • An understanding of growth and development is of cardinal importance in establishing good relations between the child and his dentist. Gesell[7] has said that growth is the key concept for the interpretation of individual differences. Although there are certain basic laws of sequence and maturation which account for general similarities and fundamental trends of child development, there are no two children who grow up in exactly the same way. Thus, it is important that each child should be considered as an individual who has his own personality. Growth is a slow phenomenon in which there are frequent periods of regression in the gradual process of maturation. The dentist must be alert to the realization that the child is not a miniature adult, and the dentist should strive to understand each child at his particular stage of development. The dentist must not become so engrossed in his efforts that he fails to remember that he has a young child in the chair.

The patient will be more relaxed dur-

ing the operative procedure if the dentist converses with him about something in which the child is interested. The facial expressions the dentist assumes and the quality and tone of his voice also can aid greatly in placing the patient at ease. Overindulgence of the child is as unwise as underindulgence in enlisting the child's cooperation. Thus, each child has to be considered as an individual in establishing a friendly personal relationship.

The role of the parent in contributing to a harmonious relationship between the child and his dentist is variable and difficult to evaluate. It would be dependent on the parents' appreciation of dentistry, their previous experiences, and their relationship with the child. Dentists should try to learn as much as possible about children; this can be done by practice, observation, and study.

It is important for the dentist to be cognizant of his own reactions toward children, being objective about himself. He cannot expect to control the child and establish a personal relationship if he cannot first control himself. He should have a positive, direct approach, and should be able to anticipate the end result prior to starting a procedure. Even the preschool child is quick to sense any sign of indecision or apprehension on the part of the operator.

The general practitioner of dentistry should not be more hesitant or reluctant to assume the responsibility of maintaining the teeth and supporting structures of the cleft palate patient in optimum health than he would be to assume this responsibility for the normal patient, if he applies the basic principles of good restorative dentistry that he employs routinely in his practice. *636 Church Street*

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The Social Climate of Epidemiology • Because of the changing universe about us, I find it difficult to visualize a world without disease and maladjustment. The atomic age, the exploration and population of space . . . will create new epidemiological and ecological boundaries. Epidemiology is basically an investigative field representing the application of the scientific method to problems of population groups generally. Various points of reference may be taken in mapping out the general ecology of man. Epidemiology thus moves with disease and disorder as its index. Its approach to human ecology is to detect, to measure, to understand the harmful influences which impair the relationship of man with his environment. It is a study of pathogenesis, not just observation. While trying to obtain adequate measurements of these stresses, the effort should lead to the better definition of health, to the better design of procedures for maintenance of health and for the prevention of its deterioration. Never before has the social climate blended so well with the biological and physical approaches to make population investigations possible and popular. But in undertaking such studies one must guard against those harmful influences which may lead to popular but dubious conclusions and to give attention to the constant need for controlled data which permit valid interpretations and conclusions. *Thomas Francis, Jr. The Epidemiological Approach to Human Ecology. The American Journal of the Medical Sciences, June 1959.*

Orthodontic treatment for the cleft palate patient

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Often, the deciduous arch of the cleft palate patient is treated orthodontically, to achieve the maximum alveolar growth potential and component. Even if the patient has to be treated orthodontically again at a later age, the problem will be less severe and the prognosis better in the permanent dentition. Second-phase orthodontic treatment usually can be coordinated with other treatment procedures of the team. Orthodontic treatment technics differ little from those for the patient without a cleft palate.

Orthodontic treatment is usually thought of as a procedure in association with the permanent dentition. With the cleft palate patient, however, considerable orthodontic treatment is frequently carried out on the deciduous arch. At the Cleft Lip and Palate Institute at Northwestern University, orthodontic treatment is started when indicated, and as soon as the child is manageable. This is done because anterior or posterior cross-bite and ectopic eruption of the deciduous teeth do not spontaneously correct themselves. Previous investigations[1-3] have shown that almost all the intercuspid width is attained by the eighth year of life. Thus, if such dental malocclusion is allowed to remain, severe orthodontic problems are certain to result at a later age in the permanent dentition.

In the posterior segments, the rationale for early treatment in the deciduous dentition can best be understood by realizing that the crypts for the succedaneous buds lie within the roots of the deciduous molars. If these teeth are tipped buccally, there is good reason to believe that the buds of the permanent teeth in their course of eruption will be directed in a more favorable direction. Some authorities believe that orthodontic expansion here involves, beyond that of the alveolar complex, expansion of that component of the maxilla itself.[4,5] We believe that our appliances tip the teeth buccally and that this primarily involves the immediate alveolar bone. The expansion of the skeletal components of the maxilla probably can be obtained more readily in the unrepaired cleft palate where cicatrix formation does not impede orthodontic expansion.

In the anterior segment, the problem is somewhat different. Here the succedaneous buds lie lingual and superior to the anterior deciduous maxillary teeth. Since the roots are single, there is little or no reason to believe that the permanent teeth will follow, even if the permanent teeth are tipped labially. How-

Fig. 1 • Arnold split lingual appliance for expansion of maxillary arch

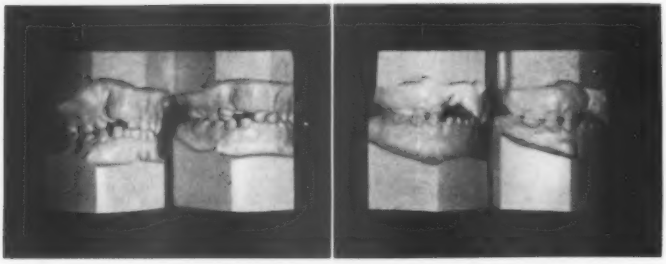

Fig. 2 • Models of patients before (at left in each view) and six months after use of appliance for correction of unilateral cross-bite

ever, the child with a cleft palate often has an attenuated growth potential in the maxilla anteroposteriorly. Thus, if the anterior maxillary teeth are allowed to remain in cross-bite, alveolar growth never will be able to reach its maximum potential, downward and forward. It will probably favor a more vertical vector while the mandible continues to move forward. Even when the deciduous anterior teeth have been aligned, the permanent incisors may erupt in cross-bite. If this occurs, a second short period of orthodontic treatment may reduce this malocclusion.

In the assessment of each case, cephalometric roentgenograms are of vital importance, for they enable us to determine, even at this early age, whether the condition will lend itself to orthodontic treatment, or will eventually become a prosthetic or surgical problem. If the anterior-posterior discrepancy is severe, it may be obvious that orthodontic treatment alone will not permanently correct the situation. Function too plays a vital role even at this early age in assessing these cases. The cross-bite resultant from abnormal functional patterns of the mandible may be more readily treatable than the one resultant from skeletal dysplasia.

In instances of cleft palate the cuspids are unique in that they are most often in cross-bite on the affected side. Also, studies have shown that the permanent maxillary cuspid on the affected side is usually slower in eruption than on the nonaffected side.[6] These factors provide additional reasons for wishing to main-

Fig. 3 • Guidance for impacted cuspid after surgical release. Left: View in early stage of treatment. Right: View at later stage

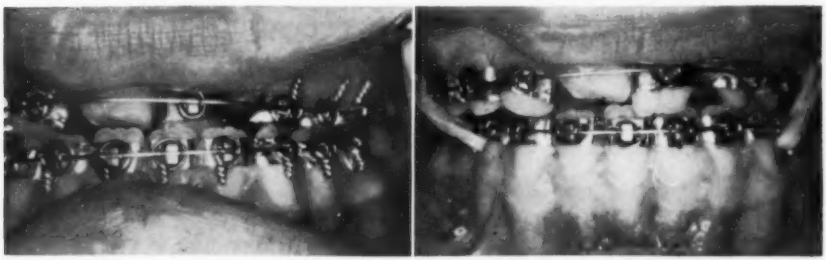

Fig. 4 • Orthodontic appliance for fixation of mandible after surgical resection. Left: View before surgery. Right: View after surgery. For other views of this patient, see Figure 1 in paper by Dr. Styleville, this issue

tain as normal or near normal occlusion as possible in the deciduous dentition of cleft palate patients.

In essence, our view regarding first-phase orthodontic treatment in the cleft palate patient is this: We are striving for maximum alveolar growth potential and component in an already attenuated region, and even if we do have to treat again at a later age, the problem will be less severe, and the prognosis will be better after the permanent dentition has erupted.

Appliances for the first-phase treatment are many and varied; they may be fixed or removable. One that we have had success with is the Arnold split lingual expansion appliance[7] (Fig. 1 and 2). It can be adapted to either bilateral or unilateral expansion.

Second-phase treatment usually can be coordinated rather well with the other treatment procedures of the team. Orthodontic treatment technics for patients with a cleft palate do not differ too much from those for the patient without a cleft palate. Full orthodontic appliances (multibanding technics) are most often used, and treatment time may be as long as with the patient not having a cleft palate. At this age, however, the cleft palate patient may need his orthodontic treatment carried out in coordination with other services of the team. As an example, if the child has congenital absence of teeth which will tend to interfere with or affect speech articulation, they may often be replaced on an orthodontic retainer to help esthetics and function for speech.

From a prosthetic point of view, orthodontic retention is of prime importance if a speech appliance is to be placed. The teeth must be retained after orthodontic treatment exactly as they were when orthodontic treatment was finished and the prosthetic impression taken. To accomplish this the retainer is placed as soon as possible after the appliances are removed, even as soon as the same day. Then too, orthodontic crowns and bands with buccal lugs many times serve as a means for clasp retention for the speech appliances.

If lip surgery is indicated, the orthodontist usually tries to establish the anterior maxillary plane of occlusion prior to the surgery. When the cuspid is impacted, surgical intervention along with orthodontic appliances will help to bring the vital cuspid into place in the arch, as shown in Figure 3. In the case of mandibular surgery on a patient with a cleft, an orthodontic multibanded appliance placed prior to surgery will help to enable better fixation postoperatively and a better final occlusion. Figure 4 shows an orthodontic appliance in place prior to mandibular surgery and some weeks after for the reception of intermaxillary elastics, which are continued for a considerable time.

Second-phase orthodontic treatment in the permanent dentition can best be thought of as a service to the cleft palate patient that helps to establish the best final occlusion possible, while serving as an aid and adjunct to the other cleft palate team services.

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The Free Realm of Thought • We live now, tragically, in one of those historical enclaves where policies of jealousy and silence again seem about to triumph. In the language of communication theory, ours is an age of noise; communication is jammed on almost every level; the man who knows—and it does not matter what it is that he knows—is constantly enjoined to keep silence, or, if he speaks, to speak so as to increase confusion rather than diminish it. We are told that secrecy of this kind is synonymous with security. But because we are living beings with a deep instinct for survival, we cannot escape the realization that the triumph of secrecy in science is not security, but stagnation. History has already seen human societies much like our present whose decline was speeded by intellectual suffocation. . . . There is, in fact, no such things as security in the realms of thought. Every new thought is a threat to the thoughtless. Every new idea is radical—it reaches to the roots of our existence, and may transform us tomorrow, or sooner. To protect the roots of our lives against the radical notion is to put mankind in a flowerpot, like a decorative but tender vegetable. And even that course offers no guarantees; flowerpots are fragile. . . . There is no scientist living today whose intellectual heritage does not stem from workers in every country in the world and over thousands of years. Were such a man to be suddenly deprived of that heritage, he would find himself back in a smoky cave, cold, hungry, and benighted—if, indeed, he could live at all. *John E. McKeen, The Pasteur Fermentation Centennial, 1958.*

Prosthetics for the cleft palate patient

Morton S. Rosen, D.D.S., Chicago

Five case reports illustrate the use of stable, one-piece prosthetic speech appliances to help the cleft palate patient. Three basic types of speech aids are constructed at the Cleft Lip and Palate Institute of Northwestern University; two are temporary appliances for children and the third is a permanent appliance for adults.

The general method and the technic for constructing a simple and flexible form of the stable, one-piece prosthetic speech appliance have been presented previously. This technic, with modifications, allows for a variety of prosthetic appliances which can be used to help the cleft palate patient. The purpose of this paper is to discuss variations of this appliance and to show examples of their use.

There are three basic types of speech aids which are frequently constructed at the Cleft Lip and Palate Institute of Northwestern University. These are shown in Figure 1. Two of these are children's appliances. The prosthesis in Figure 1, A, is a training appliance which can aid the child to develop normal speech patterns when it is not certain that velopharyngeal valving is taking place or when tolerance for a fully ex-

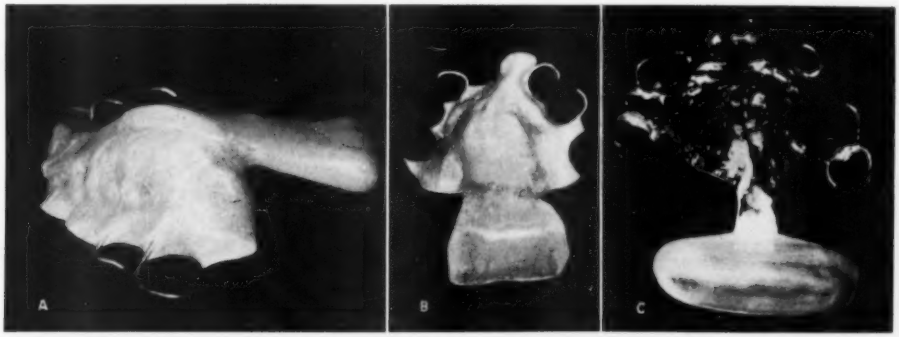

Fig. 1 • Three basic types of speech aids. A. Training appliance used during early articulation (speech) training. B. Temporary speech appliance used by young children. C. Permanent speech appliance for adolescents and adults

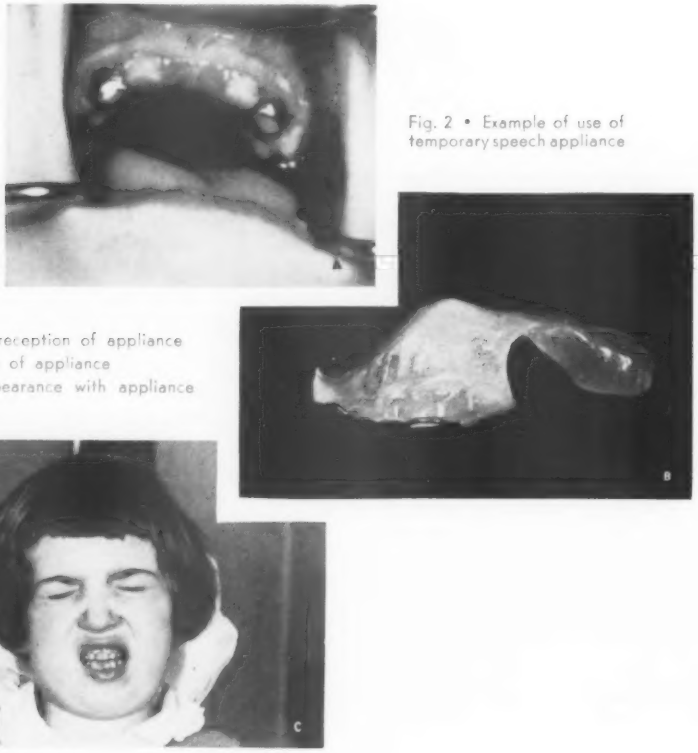

Fig. 2 • Example of use of temporary speech appliance

A. Crown for reception of appliance
B. Lateral view of appliance
C. Child's appearance with appliance

tended appliance is desired. Velopharyngeal valving is not fully accomplished with such an appliance as the speech bulb is not closely muscle-trimmed. The appliance is very helpful when used temporarily during periods of concentrated speech therapy. The second type of appliance for children is shown in Figure 1, B. This is a temporary speech appliance which does accomplish complete closure of the nasopharynx for speech. It is called a temporary appliance since it will have to be modified from time to time because of changes in dentition as well as those resulting from growth. It is used at our center in instances of velopharyngeal insufficiency in children whenever secondary surgical procedures cannot be recommended because of poor prognosis during periods of growth or because of otological complications.

The third type of prosthesis is the present-day permanent appliance for adults illustrated in Figure 1, C. The palatal portion is constructed of metal and rigidly attached to the velar section. When the speech bulb is fitted into the nasopharynx and its size and shape are closely adjusted as previously outlined, the speech problems of hypernasality and nasal emission can be eliminated completely. We feel that the design illustrated is far superior to the meatus obturator since it is applicable to all types of clefts and since it leads to a more normal substitute velum for the articula-

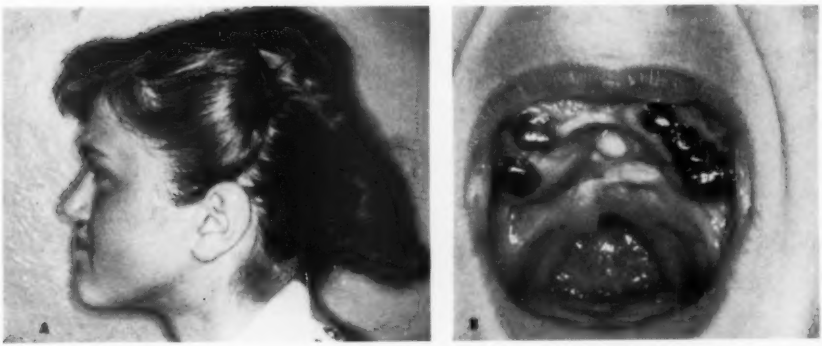

Fig. 3 • Example of use of permanent speech appliance. A. Mid-third facial deficiency before prosthetic restoration. B. Preparation of teeth before prosthesis

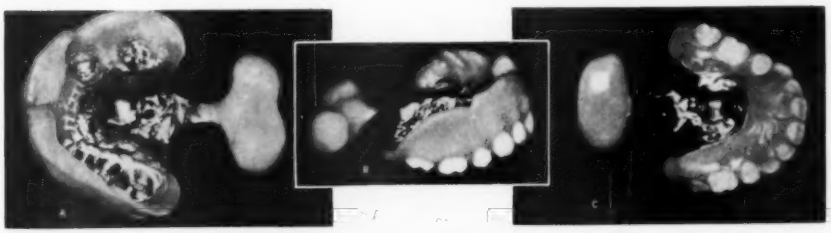

Fig. 4 • Permanent speech appliance. A. Superior view of appliance with denture. B. Lateral view showing details of speech bulb. C. Superior view

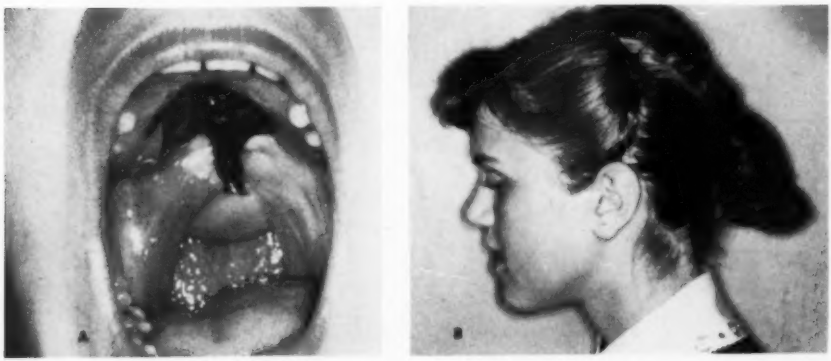

Fig. 5 • Cosmetic improvement through prosthetics. A. Speech appliance in place. B. Patient after treatment

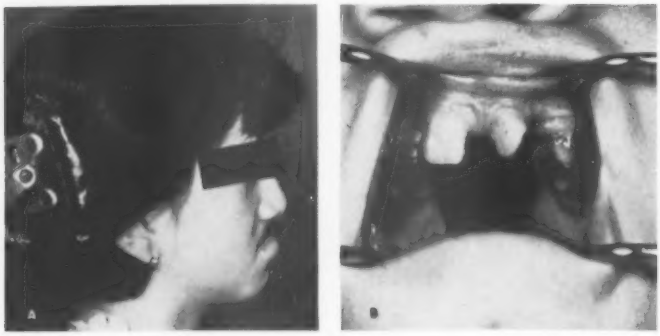

Fig. 6 • Problems of patient with "floating premaxilla." A. Profile before prosthetic restoration. B. Interoral view of maxillary arch

tion of "k", "g", and "ng" sounds. The appliance also has possible advantages over the pharyngeal flap or push-back procedures for the correction of post-operative velopharyngeal insufficiency since it results in an exact and a more adjustable control of velopharyngeal valving.

REPORT OF CASES

The following case studies exemplify the applications of prosthetic reconstructions currently in use at the Cleft Lip and Palate Institute.

Case 1 • A five year old child had an unoperated Class II cleft. The upper deciduous central incisors were missing and had to be replaced. A speech appliance also was needed. Stainless steel crowns with labial prominences were placed for additional retention of the appliance as shown in Figure 2, A. The temporary speech appliance (Fig. 2, B) was constructed for this child and the missing central incisors were incorporated. This appliance produces a satisfactory esthetic result plus functioning as a speech aid (Fig. 2, C). As the dental arches continue to grow, it is anticipated

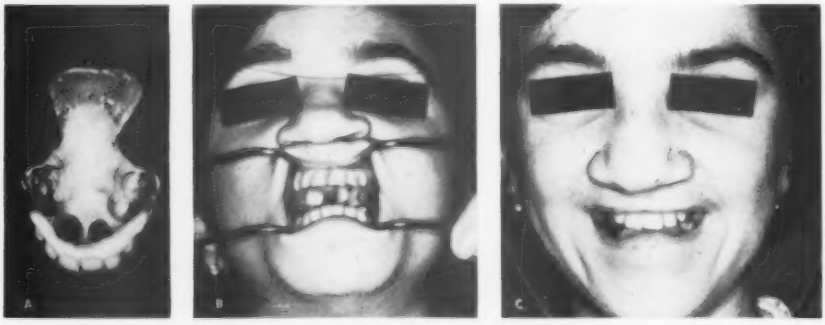

Fig. 7 • Appliance for patient with "floating premaxilla." A. Superior view showing holes for projection of incisors. B. Appliance in place showing true and false teeth. C. Front view of patient with prosthesis

that a new prosthesis will be constructed to compensate for the growth and development of the maxilla. At each of her regular re-examinations by the cleft palate team during the past four years, this girl was found to have normal speech.

Case 2 • A teen-age patient had suffered a loss of vertical dimension after surgical closure of the hard and soft palate. The problems faced by this young girl included a "dished out" appearance of the middle third of the face (Fig. 3, A) and a constricted maxillary arch and short immobile soft palate (Fig. 3, B). In a case of this type, it is of cardinal importance to crown the teeth prior to covering them with a prosthetic speech appliance. Figure 4 shows three views of the permanent speech appliance constructed for the girl. The bulb portion rested anteriorly on the posterior pillars and projected high into the nasopharynx to give good control of velopharyngeal valving for speech. With the appliance, this young girl's speech deficiency was corrected to the extent that she was recently a finalist in a Chicago area forensic contest. With the appliance in place, as shown in Figure 5, A, the maxillary constriction is corrected, the missing dental arch is replaced, and the deficiency of the middle third of the face is corrected which adds greatly to the improvement in appearance (Fig. 5, B).

Case 3 • One of the most difficult types of conditions for the prosthodontist to treat in cleft palate rehabilitation is a Class IV cleft with "floating premaxilla." The 12 year old Institute girl shown in Figure 6 illustrates the use of a possible variation of the former prosthesis which can compensate for such deficiencies. As can be seen, there was an obvious loss of vertical dimension which had to be

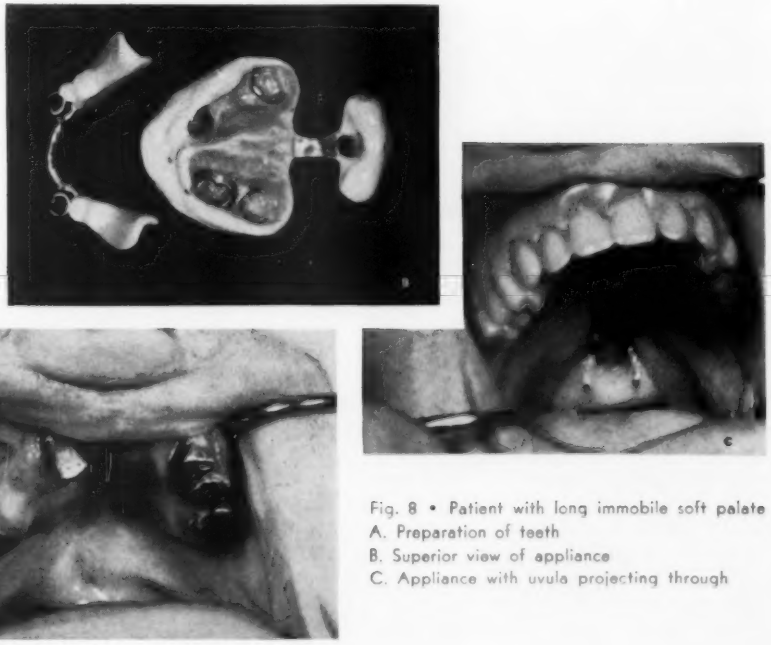

Fig. 8 • Patient with long immobile soft palate
A. Preparation of teeth
B. Superior view of appliance
C. Appliance with uvula projecting through

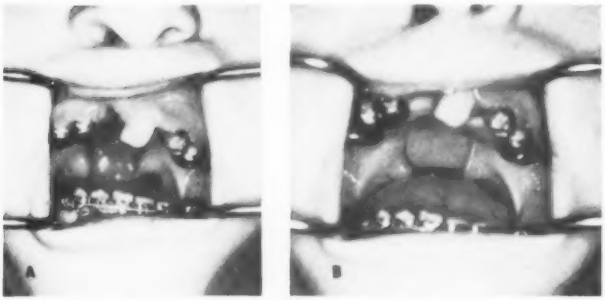

Fig. 9 • Combined treatment with temporary speech appliance. A. Orthodontic care continues on mandibular arch as teeth are crowned for appliance. B. Superior view of temporary speech appliance

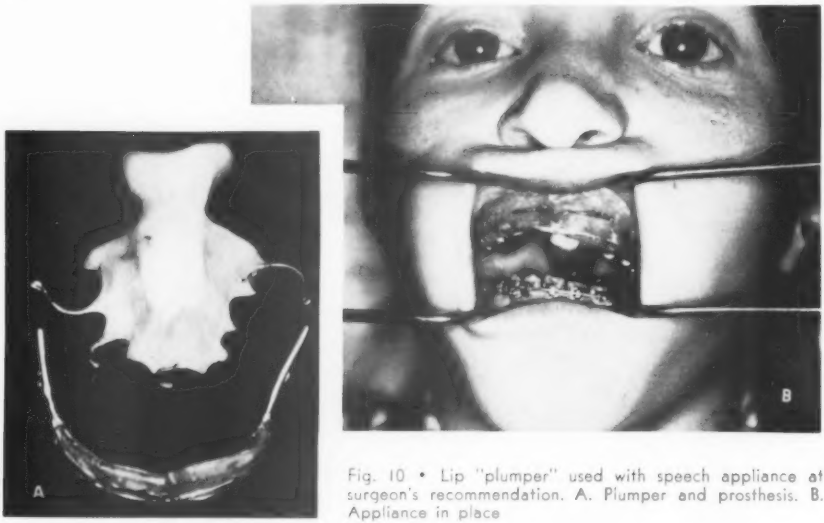

Fig. 10 • Lip "plumper" used with speech appliance at surgeon's recommendation. A. Plumper and prosthesis. B. Appliance in place

corrected with the prosthesis. At the same time, the team wished to preserve the girl's central incisors, at least for a time, so as not to add further to the bony deficiency of the maxilla. The palate in this instance was almost nonexistent, so that the hard and soft palate structures had to be replaced by the prosthesis if speech was to be improved. These problems were solved through the use of the appliance illustrated in Figure 7. It was constructed with a wide tailpiece and bulb for the control of nasality and at the same time (Fig. 7, A, B) it permitted the permanent incisors to project through the denture portion. This acted to stabilize the premaxilla and allowed for further growth and development. The speech and cosmetic improvement have remained satisfactory since the appliance was placed.

Case 4 • An 18 year old boy had an operated bilateral cleft (Class IV) together with loss of vertical dimension and some missing anterior teeth. He had a soft palate which was long but too immobile to effect closure for speech. As a result, his speech was defective, mainly because of nasal emission of air during

the production of the pressure consonant sounds. His teeth were crowned, as shown in Figure 8, A, in preparation for the reception of a permanent type of speech appliance combined with a complete overlay denture. The soft palate and uvula were low and, to avoid the necessity of reopening the palate, we elected to design the tailpiece along the inferior border of the soft palate and to leave an opening in the tailpiece to allow the uvula to project through. Figure 8, B, shows the appliance and Figure 8, C, shows how the appliance helped to fill in the maxillary deficiency, restored the dental arch and allowed for an adequate speaking mechanism without need to resect the soft palate.

Case 5 • At times it is necessary for other procedures to be used in conjunction with prosthetic treatment. Case 5, a seven year old patient, illustrates such an instance of combined treatment. This boy had a wide Class III cleft to the right with a deficiency of tissue and underdevelopment of the middle third of the face. Figure 9, A, shows the condition of the cleft and of the dentition after preparation for a temporary prosthetic speech appliance. The orthodontist was continuing his treatment on the mandibular arch. The muscle-trimmed temporary speech appliance shown in Figure 9, B, was made to correct the speech problem. Note that the tailpiece and the bulb were placed into and above the palatal shelves to effect obturation and valving. The cleft palate team felt that the upper lip was very tight and might be retarding maxillary growth. As it was not an opportune time for a lip revision, the surgeon recommended the construction of a lip plumper to be fastened to the prosthesis and used to stretch the upper lip. Figure 10 shows the speech appliance and plumper and the method of placement. This case exemplified a practical instance of cooperation between surgeon, orthodontist, prosthodontist and speech pathologist.

30 North Michigan Avenue

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Hope • Our shelves hold many books now on the place of faith in science and the healing arts, especially psychology and psychiatry, and on the vicissitudes of man's efforts to love and to be loved. But when it comes to hope, our shelves are bare. The professional journals are silent. The *Encyclopaedia Britannica* devotes many columns to the topic of love, and many more to faith. But hope, poor little hope, is not even listed. . . . Hope is another aspect of the life instinct, the creative drive which wars against dissolution and destructiveness. The Greek philosophers and the later Greek literature tended to the view that since fate was unchangeable, hope was an illusion, "the food of exiles" (Aeschylus) or "man's course" (Euripides). Solon, Simonides, Pindar, Thucydides and others stated the same opinion in different ways. . . . However, St. Paul, writing to Greek friends, declared that hope would stay along with love. In this Paul was loyal to his Hebrew heritage (Psalm 42, Isaiah 40) as well as his Christian convictions. . . . Each of us who has been in practice more than a decade has seen the "hopeless case" recover. And we have sometimes seen, or so it seemed, that a mother's or father's indomitable hope was a factor in the recovery. Hope is not identical with optimism—optimism always implies some distance from reality—so that obstacles appear attenuated. The optimist, like the pessimist, emphasizes the importance of the "I." But hope is humble, it is modest, it is selfless. Unconcerned with the ambiguity of past experience, hope implies process; it is an adventure, a going forward, a confident search. *K. Menninger. Hope. Am.J.Psychiat. Dec. 1959.*

Secondary surgical procedures in cleft palate treatment

Orion H. Stuteville, M.D., D.D.S., Chicago

Three case reports illustrate the results obtained by coordinated treatment in the rehabilitation of older cleft palate patients for whom earlier treatment was incomplete or inadequate.

In addition to the early closure of clefts of the lip and the later selective primary closure of cleft palate, the plastic surgeon is often called on to help adolescents and adults with cleft palates who, for one reason or another, have poor speech or facial deformities. Surgical procedures, unfortunately, have been blamed for producing all of the deformities of cleft palate patients. This idea certainly is not necessarily true, and is not true with the careful procedures which are generally used today. It is true that if a lot of surgery is done which produces considerable scarring, or an early and forced technic of closure is used, disturbances in growth will result. However, many of the facial deformities of the older cleft palate patients are due to congenital deficiency of tissue, which even the most judicious surgery cannot replace, or to abnormal functional forces, particularly to malocclusion. I have seen adult patients who never were operated on who had considerable deformity of the middle third of the face.

At the Cleft Lip and Palate Institute of Northwestern University a large number of older patients are treated whose earlier treatment was incomplete or inadequate. There are two general types of secondary surgical procedures which the plastic surgeon may perform for the rehabilitation of such patients. Secondary palatal operations may be performed to correct velopharyngeal insufficiency if the original closure failed to do this. Facial reconstructive surgery and final cosmetic surgery may be used to correct facial deformities and facial scars.

Secondary palatal surgery often can serve the same purpose as a speech appliance, and it can do this without the disadvantages involved in the use of a large prosthesis. There are various forms of secondary palatal operations which could be selected, including cartilage implants in the nasopharynx and the "push back" operation. Today, however, the broad pharyngeal flap which is sutured superiorly to the soft palate and which leaves a small 3 mm. opening on each side of the flap is used most frequently. This opening is closed off during speech by the action of the salpingopharyngeus muscle. At some centers, this operation is being used for the primary closure of

all types of clefts. We feel that since simpler tested operations are satisfactory in most instances and can produce more normal anatomic and physiologic results, this operation should be used chiefly for palatal revisions. A careful longitudinal study of the success of this procedure on a number of selected patients is being carried out at the Institute at the present time.

REPORT OF CASES

Case 1 is an example of the place of the secondary palatal operation in the rehabilitation program of one Institute patient. This 19 year old boy was born with a right Class III cleft which was satisfactorily closed through one operation on the lip when he was six weeks old and one operation on the palate when he was 25 months old. When he was 16 years old he was referred to the Institute by the Division of Services for Crippled Children of the State of Illinois to see if there were anything else that could be done for him.

The boy had received good orthodontic care but he had a pronounced "cleft palate" speech defect. Speech tests and cephalometric studies showed that the palate was inadequate for normal speech and that this was the main problem. School reports and psychological tests were taken before deciding between using a speech appliance or performing a secondary palatal operation. Since these tests and the school history indicated a limited potential and since oral hygiene was poor, a surgical procedure was strongly favored. The broad pharyngeal flap was selected because there was very good action of the salpingopharyngeus and the levator veli palatini muscles. The operation was performed when the patient was 17 years old. In the operation, the soft palate was split in the midline for 1 cm. A flap was turned from the nasal mucosal surface of the palate out to almost the lateral wall at both sides. The pharyngeal flap was then constructed, taking the mucosa and the superior constrictor down to the prevertebral fascia. The flap, which measured 2½ by 2½ cm., was based superiorly and the mucosa from the nasal surface of the palate was sutured over the flap. The defect on the posterior pharyngeal wall was sutured. Postoperative recovery was good. Speech studies shortly after surgery showed that hypernasality was eliminated but that the patient was somewhat denasal. The "m" and "n" sounds could not be made. Studies six months later showed good resonance balance and some improvement on "m" and "n." It is now two years after surgery, and speech is normal in resonance and there are only occasional articulation errors due to former habits.

Reconstructive and cosmetic surgery often is of greatest importance to the person with a cleft palate. There is much that the plastic surgeon can and should do for patients with cosmetic deformities. Frequently, after growth has been completed, patients who had clefts of the lip can benefit from lip and scar revisions and from rhinoplasty. The Estlander lip flap procedure and retrusion of the mandible sometimes are necessary in patients with gross skeletal abnormalities with restricted maxilla and overdeveloped mandible. Nose revisions, otoplasty, maxillary fracture and repositioning, cartilage implants and other procedures are used when called for to give the patient a normal appearance. The following case reports illustrate the use of such procedures.

Case 2 (Fig. 1, A and B) was a 15 year old Institute patient who had good speech but needed further help if her appearance was to be improved. The girl's mandible was prognathic, her upper lip was tight and scarred and the lower lip was protrusive. Early palatal surgery had been completed before she came to the Institute. Dental, orthodontic, and speech therapy treatment had gone as far as it could to rehabilitate her. In order to

Fig. 1 A and B: Two views of Case 2 at age 15 before secondary facial reconstruction. C and D: Abbey Estlander lip flap procedure, showing first and second stages of flap cut. E and F: Two views of Case 2 after lip flap and mandibular resection

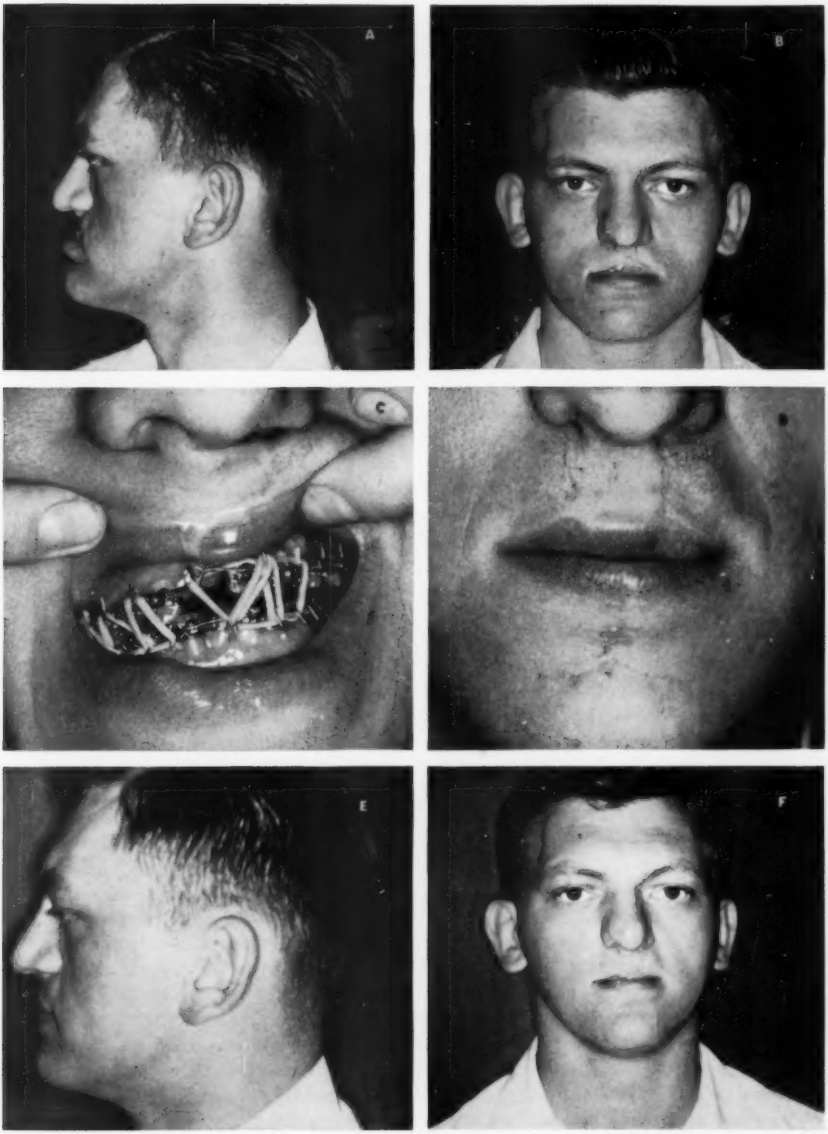

Fig. 2 A and B: Two views of Case 3 before "coordinated" treatment. C: Orthodontist repositioned teeth prior to mandibular retrusion and "fixed" mandible after surgery. D: View of lip and lower face after lip flap procedure. E and F: Rehabilitation essentially completed after combined and coordinated surgical, orthodontic, prosthetic and speech rehabilitation procedures

correct the tightness and deficiency of the substance of the upper lip, a two stage Estlander flap procedure was completed. In the first stage of this procedure (Fig. 1, C) the old scar in the upper lip was excised and a flap from the lower lip was excised leaving an attachment of the inferior labial artery on the right side. The block was sutured to the upper lip and the defect in the lower lip closed. Figure 1, D shows the second stage of the procedure. The flap was cut and the vermilion borders were aligned.

Eight months later the mandible was repositioned to correct the forward protrusion by about 2 cm. The teeth were prepared first for crisscross elastics. In this operation an incision was made on the inside of the ear behind the tragus and the condyloid process was sectioned on each side. A 1 cm. section of bone was removed from each side. A hole was drilled through the condyloid process and the mandible fractured. Another hole was drilled through the ramus in the notch region. When both sides were free, elastics were placed between upper and lower arches and the mandible was moved back so that the lower incisors were posterior to the upper. Wire was threaded through the holes to secure the position on each side and the wound was closed. Figure 1, E and F shows the patient three years after the operation. She now has normal speech and an attractive appearance.

Case 3 is a final illustration of the importance of coordinated treatment in the rehabilitation of an older patient. Figure 2, A and B shows the patient as he appeared some six years ago. His facial deformity obviously required reconstructive surgery. However, before this could be done to the patient's greatest advantage, other treatment had to be carried out. The patient had extensive caries which needed immediate attention. He needed orthodontic treatment for the expansion of the maxillary arch. Through the cooperation of a private dentist and the Institute's clinic services, this treatment was carried out as expeditiously as possible. The patient had a short and inactive palate and hypernasal speech. The team advised a permanent type of prosthetic speech appliance. Muscle training was carried out in the Institute's speech clinic preparatory to placement of the speech appliance and during the period of orthodontic treatment. After orthodontic expansion of the upper arch, the posterior teeth were elongated through the use of a bite plane. The patient was then ready for facial surgery. Full appliances were placed on the teeth by the orthodontist as shown in Figure 2, C. A mandibular retrusion operation as used for Case 2 was carried out with good results. A short period of orthodontic retreatment was necessary. The speech appliance was constructed immediately after this and acted as an orthodontic retainer. Some speech training was then given to help the patient clear up functional articulation disorders. An Estlander lip flap procedure in which the scar on the upper lip was excised and a flap rotated as was done in Case 2 was carried out. Figure 2, D shows the changed appearance of upper and lower lips after this procedure. The patient now has normal speech and normal appearance. He is working successfully as an engineer after completing college and plans to enter medical school. Figure 2, E and F shows the appearance of the patient after the completion of his treatment program. Some further final revision of lip and nose may be carried out. Rehabilitation of this patient required the close cooperation of private dentist, and orthodontic, surgical, prosthetic, and speech specialists.

700 North Michigan Avenue

An improved dental surveyor

William Sollé, D.D.S., U. S. Navy*

A new dental surveyor has been developed which is described as versatile, practical, and of value to a large laboratory or to a dentist desiring to design and prescribe special prostheses. Another instrument has been completed which facilitates making parallel preparations in the oral cavity.

The dental surveyor found on the market today is an instrument to locate and measure certain undercuts on casts of teeth which assist in the retention of removable partial dentures. It also locates and determines the path of insertion of the partial denture, aligns special attachments such as precision attachments, shows where relief is needed on the master casts and aids in contouring the relief, and determines the degree of undercuts.

Several different kinds of surveyors offering varying degrees of accuracy are on the market. Among these are such popular types as Lentz, Ney, Torit and so forth.

These surveyors, with their accessory parts, are capable of various functions, and many dentists have developed a great deal of skill in their use. However, they do not offer the degree of refinement or precision machine work that is desired, nor do they offer a high degree of controlled vertical and horizontal movement.

Many dentists have felt the need for an improved dental parallelometer that would offer greater versatility, maneuverability and accuracy than any available on the market today.

With this need in mind it was conceived that by the incorporation of various simple ideas into one unit, an improved surveyor might be developed. Such a surveyor should have incorporated into it all the following qualities.

1. Great ease of manipulation and flexibility with a minimum of backlash.
2. Great accuracy.
3. Ability to cut parallel preparations of great accuracy on models.
4. Usefulness in conjunction with precision attachments.
5. Ability to perform all the normal functions of commercial surveyors.
6. Ability of the distal working arm to perform the following movements; namely, vertical and horizontal (in all directions, hence, circular), while maintaining parallelism.

DESCRIPTION OF SURVEYOR

To achieve the qualities mentioned, the surveyor was divided basically into two main parts to function either independ-

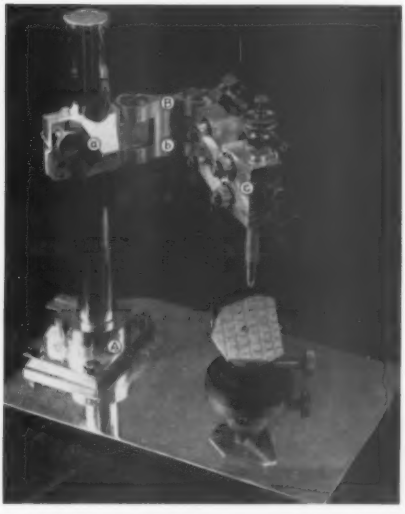

Fig. 1 • Surveyor proper, consisting of (A) vertical rod and platform, and (B) horizontal arm and its components. Proximal arm (a) allows vertical adjustment for any height. Middle arm (b) permits horizontal rotation. Distal arm (c) with handpiece allows vertical and horizontal movement. Combination of three arms permits considerable freedom of movement

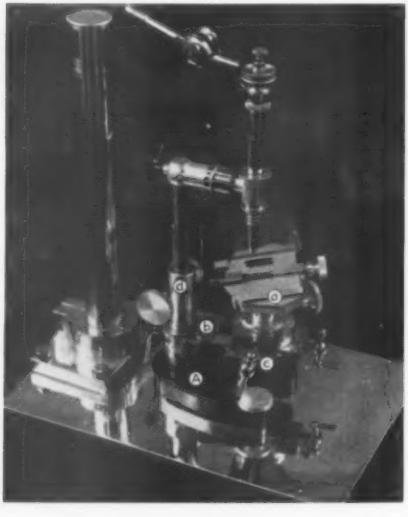

Fig. 2 • Mounting unit (A) is used mainly for precision attachments. Ney surveying table (a) is mounted on ball arrangement which can be fixed in any position. Two horizontal tables (b and c) allow horizontal movement to and fro and sideways. Straight handpiece can be put in any desired position and raised or lowered by means of microscopic gear attachment (d)

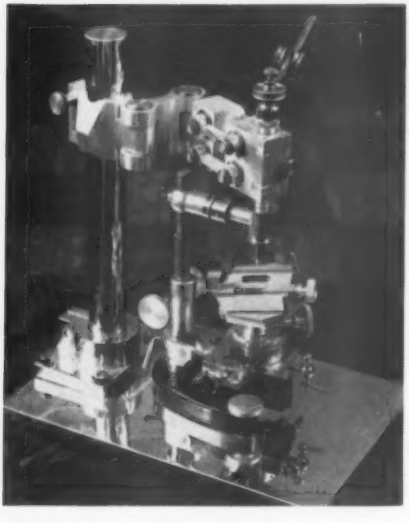

Fig. 3 • Combination of surveyor proper and mounting unit can be used to enhance stability of straight handpiece, when extreme accuracy with very fine cutting adjustment is desired.

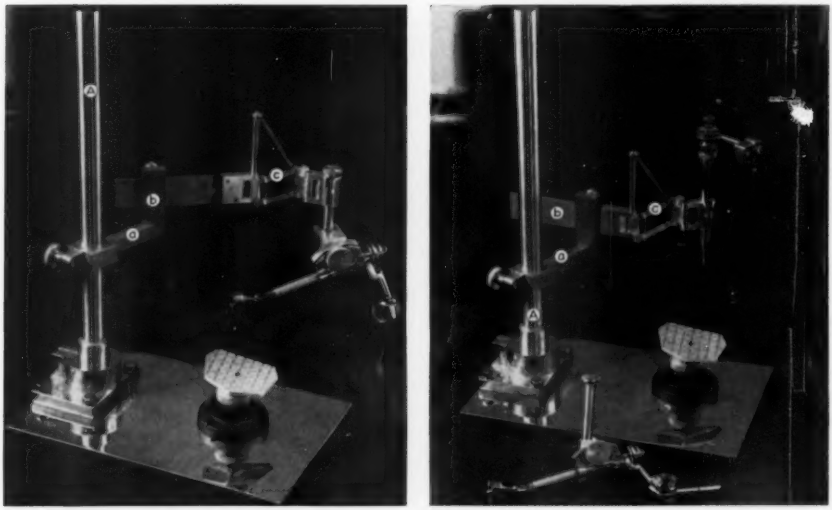

Fig. 4 • Accessory unit. (A) additional vertical rod with (a) horizontal arm for attachment, (b) sliding horizontal bar for extension and rotation, and (c) paralleling section. Unit is shown with contra-angle and straight handpiece in position for use as a surveyor. Primary function of unit is to make parallel preparations directly in oral cavity (see Fig. 5) in conjunction with different mount

Fig. 5 • Accessory unit or paralleling device, used primarily to make parallel preparations directly in oral cavity. Views illustrate unit in use and show how it can be moved from side to side while maintaining parallelism

ently or in conjunction with each other. For descriptive purposes these might better be referred to as the surveyor proper and the mounting unit.

The surveyor proper (Fig. 1) is used basically to perform all the functions of the normal surveyor and in addition may be utilized for the construction of precision attachments.

The mounting unit (Fig. 2) is designed primarily for the parallel cutting of preparations as well as for the proper placement of the precision attachments on models.

The surveyor proper and the mounting unit are shown when used in combination in Figure 3.

Surveyor Proper • The surveyor proper (Fig. 1) is divided into three parts:

1. The basic platform and vertical rod (Fig. 1,A), the function of which is self-explanatory.

2. A jointed extension arm (Fig. 1,B) which incorporates a removable straight handpiece. This is composed of several sections:

a. The first or proximal section (Fig. 1,a) allows for adjustment to the proper height.

b. The middle arm (Fig. 1,b) permits horizontal movement.

c. The distal arm (Fig. 1,c) contains the straight handpiece and allows for vertical movement, while maintaining parallelism.

All the movable joints are precision ball-bearing to allow for ease of operation, yet so spaced as to insure accuracy with a minimum of movement due to any lateral thrust.

The rigidity and light weight of the entire arm is dependent on the qualities inherent in the Duralumin casing.

To enhance and preserve the original condition, all remaining metal has been chrome-plated.

3. The accessory unit (Fig. 4) is composed chiefly of an additional vertical rod (Fig. 4,A) with two extension arms (Fig. 4,a and b) and the paralleling section (Fig. 4,C). The primary purpose of this unit was more of an experimental nature toward additional objectives. It is also part of a unit utilized in making parallel preparations in the oral cavity (Fig. 5).

Mounting Unit • The mounting unit (Fig. 2) is composed of the following:

1. The model is locked upon a Ney tilt-table (Fig. 2,a). This table is mounted on two additional tables (Fig. 2,b and c), both of which have controlled horizontal movement.

2. This unit also has a straight handpiece which is gear-mounted (Fig. 2,d) in a "drill press" fashion directly over the table and allows for controlled vertical movement.

With such combinations of both controlled vertical and horizontal movement, guided precision can be obtained for cutting of parallel preparations which are utilized in the field of precision attachments.

Figure 3 illustrates how the surveyor proper may be utilized in conjunction with the mounting unit when extreme stability and rigidity are desired for very fine cuttings.

I am grateful that I was able to incorporate into this instrument some of the time-proved principles of the well-known Lentz surveyor and the Ney surveying table.

FUNCTIONS AND ACCOMPLISHMENTS OF SURVEYOR

As a result of the combination of various simple principles, it is felt that the resulting surveyor, while simultaneously allowing for greater flexibility and accuracy, may be utilized to perform the following:

1. Tasks normally falling within the scope of a surveyor, such as the surveying of models in preparation for cast partial dentures.

2. Tasks similar to those used with a drill press insofar as its rigidity incorporates a straight handpiece.

3. Tasks requiring a table to hold casts firmly at any desired angles.

4. Tasks requiring controlled horizontal and vertical movement for guided precision cutting of preparations.

CONCLUSION

I believe that this surveyor has fulfilled the intended requirements. However, an additional change, although not considered necessary, might be the addition of an extra section to the middle arm. This would allow for greater horizontal freedom as well as extension if desired.

Another modification could be the incorporation of a "setlock" to maintain the handpiece at a given position when not used in conjunction with the mounting unit.

This surveyor is versatile and practical. It is believed that it would be of value to a large laboratory or to a dentist who is desirous of designing and prescribing special prostheses.

ADDITIONAL EXPERIMENT

Another instrument has been completed with which to make parallel preparations directly in the oral cavity. This has been found to be particularly useful in the preparation of fixed bridgework, especially in the alignment of parallel grooves, as well as in the preparation of pins utilized in retention. This instrument also has been found to offer considerable accuracy and a great deal of personal satisfaction when used as indicated. Figure 5 illustrates this instrument utilizing the straight handpiece.

Anyone interested in the performance of either of these instruments and wishing additional information relative to such, is invited to write the author, who shall be happy to respond to any inquiries.

The opinions or assertions contained in this article are the private ones of the writer and are not to be construed as official or reflecting the views of the Navy Department or the naval service at large.

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Public Health Education • Organized community health education in the United States, as it is presently practiced, does more than educate people about health. Owing to the very nature of the methods utilized, which are based on the best current understanding of the educational process, the people themselves are required to assume responsibility for their own and their community's health through understanding their health problems, planning for prevention, eradication or control, and acting on their plans. This approach necessarily guides people into a consideration of health in its broadest meaning, because emerging and existing health problems in this country are multifaceted in both origin and solution. The problem-solving approach applied to these current health problems, which have many roots, has a real potential for deepening and developing the public's experience in democracy and, at the same time, focusing their interest and concern on the total development of their communities rather than upon health alone. Viewed in this way, public health education is adult education in the most fundamental sense. ***Beryl J. Roberts and William Griffiths. Handbook of Adult Education in the United States, 1960.***

Halothane in dental anesthesia

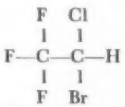
Max S. Sadove, M.D., Chicago; Reuben C. Balagot,† M.D., Chicago, and Joel M. Berns, D.M.D., Cleveland*

With a new anesthetic agent, halothane, general anesthesia was induced in 192 outpatients in a hospital dental clinic. The dental procedures consisted of single or multiple tooth extractions. Either the Fluotec or the Trimar vaporizer was used. It required 2 minutes 34 seconds to induce anesthesia in patients with the Fluotec vaporizer, on the average, and 3 minutes 23 seconds (49 seconds longer) with the Trimar vaporizer. The recovery time was almost equal with both vaporizers. Excitement on recovery was high, but of brief duration and mild. Arrhythmias occurred in 5 patients, bradycardia in 28 patients, and nausea and vomiting in 15 per cent of the Fluotec patients and 24 per cent of the Trimar patients for the 24-hour postoperative period. Halothane is a potent, rapid-acting, pleasant, nonflammable, nonirritating anesthetic vapor of probable great value in dental anesthesia. At present its administration should be restricted to the anesthesiologist who has been trained in its use.

The need for an excellent, safe, efficient general anesthetic that is pleasant and consistent in its effects is urgent. Nitrous oxide has been found to satisfy many of the characteristics of the ideal general anesthetic, except potency. Attempts in the past to circumvent this relative impotence by increasing the concentration of the gas to hypoxic levels have resulted in unwarranted complications, including needless deaths. Trichloroethylene was employed as a supplement to nitrous oxide and has gained wide adherence. Having employed this combination extensively, we frequently get the feeling it is not a satisfactory anesthetic in some instances. The ethers such as diethyl ether, vinyl ether, and ethyl vinyl ether have been utilized but have the disadvantage of being flammable, aside from other properties that do not enhance their usefulness. Ethyl chloride and chloroform are toxic to the heart. Some groups employ intravenous thiopental sodium, sacrificing safety to the ease and pleasantness of induction. It would be repetitious to state that aside from its poor analgesic properties, its intravenous mode of administration implies relative uncontrollability of dosage. Some of the narcotic analgesics such as meperidine hydrochloride and alphaprodine hydrochloride have been employed. They lack the hypnotic and sedative action of thiopental sodium. The greatest disadvantage of all drugs given intravenously is their dependence

on the body for their metabolic breakdown. Needless to say, where there is a relative inefficiency of these metabolic systems, the effects of these intravenous agents may be magnified tremendously. Conversely, the inertness of the inhalation agents and their independence of the metabolic systems may be considered a great advantage when viewed in terms of relative safety. A new agent which seems to fulfill many of the virtues desirable in an anesthetic has recently been introduced into clinical anesthesia. It is halothane (Fluothane).

Halothane is a fluorinated compound whose chemical formula is:



2-bromo-2-chloro-1, 1, 1-trifluoroethane

It is liquid and has a boiling point of 50.2°C. which insures its volatility. It is nonflammable and nonexplosive in both air and oxygen. Halothane has an agreeable odor which is considered pleasant by many. It has been administered by means of the open drop method, but to insure a consistent concentration of vapor, special vaporizers have been developed such as the Fluotec, which was employed in this investigation.

Pharmacologically, halothane has been studied extensively both in animals and man. Its proximity to chloroform in its chemical formula might lead to the rash conclusion that it is another chloroform with all its accompanying toxic effects. Studies on the various organ systems do not seem to bear this out. Although the drug is remarkably potent, the toxicity observed with chloroform on the liver and the cardiovascular system has not been shown with halothane to the same serious degree. The use of this agent for various types of surgical procedures has been reported in the literature, with minimal complications so far.[1,2]

MATERIALS AND METHODS

Outpatients in the hospital dental clinic were employed in this study. These groups of patients were not selected and were given no premedication. The only preoperative preparation was omission of lunch, as all of the procedures were done in the afternoon. The dental procedures consisted of extractions ranging from a single tooth extraction to full mouth extractions. The patients were divided into two groups according to the type of anesthetic vaporizer used. The vaporizers employed were the Fluotec and the ordinary Trimar (trichloroethylene) vaporizer, both of which were attached to a Heidbrink Simplex Dental anesthesia machine. The Trimar unit is a simple trichloroethylene vaporizer developed by the Ohio Chemical Company for use with the Heidbrink Simplex Dental anesthesia machine or the ordinary Heidbrink anesthesia machine. It must not be confused with the Cyprane inhaler manufactured in England that is used for vaporizing trichloroethylene with inhaled air.

Both the Fluotec and Trimar vaporizers were attached in a direct line of gas flow. Such a technic has been considered dangerous by several groups. The inherent danger was modified by the rate of gas flow and by short exposure time to the anesthetic, and by an awareness of its influence on drug concentration. The Fluotec vaporizer was used on 142 patients; the Trimar vaporizer was used on 50 patients.

Fluotec Vaporizer • The Fluotec is a special vaporizer designed primarily for halothane. It is made in England to fit a Boyle anesthesia machine but is adaptable to any other anesthesia machine—in this study, the Heidbrink Simplex. The special features of this vaporizer are that it has a temperature-compensated valve which assures accuracy of percentage vaporization over a range of

55°F. to 90°F. and that it is calibrated to deliver from 0.5 per cent to 3.0 per cent halothane vapor by volume at 4 to 16 liters flow—the calibration intervals being 0.1 per cent.[3]

METHOD

The patients were anesthetized routinely on a dental chair without any straps to hold them down. A nose mask and a mouth mask, which are the usual accoutrements of the dental machine, were employed to administer the anesthetic. A bite-block was not placed before induction as is done frequently with trichloroethylene nitrous oxide oxygen anesthesia, to test the ability of halothane to relax the mandible; the bite-block was placed after induction. With a flow rate of 8 to 16 liters of 75 per cent N_2O—25 per cent O_2 from the Heidbrink Simplex, halothane 0.5 per cent was immediately added to the mixture and rapidly built up to a concentration of 2.5 per cent. After the first few patients were treated, it was found that this concentration rarely was necessary to achieve surgical anesthesia. The average maximum concentration needed for surgical anesthesia varied between 1.5 per cent to 2 per cent halothane. Maintenance was invariably and sufficiently carried out with 0.5 per cent concentration.

As was done in a previous study employing another agent,[4] the following phases of anesthesia were observed and timed:

1. Induction—from the moment the anesthesia masks were applied and the gas flow initiated to the time the surgical procedure was started.
2. Maintenance—from the moment the surgical procedure was started to the time administration of anesthetic gases was ended.
3. Recovery—from the time anesthesia was stopped to the time the patient got off the dental chair to walk to the recovery bed or chair outside the dental office with or without some arm support.

Observations were made on the different organ systems such as:

1. Cardiovascular system — rate, rhythm, blood pressure.
2. Respiratory system—rate, rhythm, other complications.
3. Gastrointestinal tract — nausea, vomiting.
4. Nervous system—excitement, headache, euphoria, dizziness.

Table 1 • Average time of different phases of anesthesia according to vaporizer

Phase	Fluotec	Trimar
Induction	2 min. 34 sec.	3 min. 23 sec.
Maintenance	5 min. 28 sec.	7 min. 29 sec.
Total anesthesia time	8 min. 2 sec.	10 min. 52 sec.
Recovery	3 min. 36 sec.	3 min. 27 sec.

OBSERVATIONS

Except for observations made on the cardiovascular system, which were made throughout the whole period of anesthesia, the other observations were noted during induction or recovery. Because of the brief period within which the whole procedure is carried out, great attention was paid to the occurrence of positive changes in the physiology of the different organ systems mentioned.

Although treatment of only 192 patients is reported in detail in this paper, at least another 200 have been similarly treated by us during the last few months. Our original conclusions were upheld by these cases (Table 1).

It is interesting to note that it took almost a minute (49 seconds) longer to induce anesthesia in patients with the Trimar vaporizer than with the Fluotec vaporizer, using the same machine (Heidbrink Simplex) with identical gas flows. This probably attests to the efficiency of the Fluotec vaporizer as claimed by the manufacturers and demonstrated by the Department of Pharmacology at the Uni-

Table 2 • Cardiovascular changes

Changes	Fluotec (142 patients)	Trimar (50 patients)
Pulse		
Arrhythmias	5 patients	none
Tachycardias	20 patients	6 patients
Bradycardias	22 patients	6 patients
Blood pressure		
Rise	35 patients	15 patients
Fall	9 patients	5 patients

versity of Toronto.[3] It further implies the delivery of a consistent vapor concentration that may induce a patient into the deeper planes of anesthesia easily and quickly. On the other hand, a prolonged induction process, assuming all other circumstances to be equal, points to the delivery of an inconsistent vapor concentration which can cause an erratic progression into the deeper planes of anesthesia with all its attendant complications such as vomiting, excitement, secretions and possibly laryngospasm. This difference in efficiency of the two vaporizers is highlighted further by the fact that the majority of the anesthetics were administered under supervision by a dental resident (J.B.) who had just started his training period in anesthesiology. The patients on whom the Fluotec was used were treated before those on whom the Trimar was used, so he had already gained some degree of experience and proficiency. In spite of this, the induction period under the Trimar vaporizer was not shortened materially. The prolonged maintenance time under the Trimar vaporizer further proves the relative difficulty in maintaining a consistent plane of anesthesia, probably because of the erratic concentrations of vapor delivered.

The recovery time was surprising. It was almost equal for both vaporizers—3 minutes and 36 seconds for the Fluotec as compared to 3 minutes and 27 seconds for the Trimar vaporizer, in spite of the longer maintenance period under this vaporizer. It may mean that the proved efficiency of the Fluotec caused the patients to go into a deeper plane of anesthesia despite shorter exposure time to the halothane vapor. This ability of patients to recover quickly from the anesthetic despite the considerable difference in efficiency of the vaporizers must be credited to the anesthetic gas. Most investigators have commented on the rapid recovery rate from halothane.[1, 5]

There was no correlation between the changes in pulse rate with the changes in blood pressure (Table 2). Bradycardia did not necessarily cause a fall in blood pressure, and tachycardia did not necessarily cause a rise in blood pressure. Had the exposure to the anesthetic agent been longer, it is possible that a correlation between pulse rate and rhythm changes with blood pressure changes might have become more evident. The relatively high incidence of bradycardia and hypotension was rather disturbing. Yet no special treatment was required other than adjustment of concentration of halothane and no harm resulted from its relatively unskilled use in the initial phase of study.

Other complications occurred (Table 3). Most of these may be ascribed to the anesthetist's relative unfamiliarity with the technic. The respiratory complications obviously are a result of the introduction of strong concentrations of vapor, irritating the patient's respiratory tract. The small number of patients developing

Table 3 • Complications occurring during induction period

Complication	Fluotec (142 patients)	Trimar (50 patients)
Respiratory		
Breathholding	21 patients	7 patients
Coughing	11 patients	4 patients
Increased secretions	3 patients	none
Laryngospasm (partial)	5 patients	6 patients
Other organ systems		
Excitement	3 patients	1 patient
Vomiting	1 patient	2 patients
Voided bladder	none	1 patient

Table 4 • Complications occurring during recovery period

Complication	Fluotec (142 patients)	Trimar (50 patients)
Central nervous system		
Headache		
Immediate recovery period	9 patients	1 patient
In 24 hours	10 patients	4 patients
Excitement	36 patients	14 patients
Disorientation	9 patients	1 patient
Dizziness	1 patient	1 patient
In 24 hours	1 patient	1 patient
Shivering	1 patient	1 patient
Gastrointestinal tract		
Nausea & vomiting		
Immediate recovery period	4 patients	3 patients
In 24 hours	12 patients	6 patients
Vomiting		
Immediate recovery period	4 patients	1 patient
In 24 hours	2 patients	2 patients

excitement (and the brevity and mildness of this excitement) during induction again serves to emphasize the potency and the rapidity of induction that may be obtained with this drug.

Excitement on recovery was extremely high (Table 4). This was probably because all these patients were not premedicated and were treated as outpatients. Coming from an invigorating wintery atmosphere outside directly into the dental chair is not conducive to a state of tranquility. Excitement was short in duration and relatively mild. The incidence of nausea and vomiting taken together seemed high—15 per cent for the Fluotec unit patients and 24 per cent for the Trimar unit patients. This was for the whole 24 hour postoperative period. If only the immediate recovery period was considered, these figures can be cut to less than half.

A postcard was handed to each patient at the end of the procedure, or to the accompanying adult if the patient was a minor. Instructions were given to check their reaction to the anesthetic and any observed complication. The majority of the patients anesthetized with either vaporizer signified their preference for the anesthetic, which attested to the pleasantness of the agent as far as inhalation of its vapor, odor and rapidity of induction were concerned (Table 5).

DISCUSSION

The potency of this drug is impressive. Its ability to induce profound anesthesia rapidly is reminiscent of cyclopropane and, particularly, of chloroform. The availability of a special vaporizer, the Fluotec, probably contributed to its anesthetic efficiency; but we had administered this agent by means of the archaic open-drop method with equally good results. The ability of patients to recover from the drug was impressive. The fact that the patients in this series were exposed to the agent for a relatively short time did not detract from this. Our experience with this drug in other types of operative procedures where the patient inhaled the drug for longer periods of time (from 2 to 4 hours) showed the recovery to have been just as rapid.

One group[2] has commented on the development of tachypnea during the early phase of anesthesia. We were not too impressed with this observation in this series. The mechanism was similar to that of trichloroethylene, although the significance of this may be belittled in the sense that it was not indicative of drug

toxicity as was true with trichloroethylene. Halothane depresses respiration considerably with deep anesthesia.

Its effects on the cardiovascular system were of tremendous importance to the anesthesiologist who would venture to employ this drug. In our series (Table 2) arrhythmias were few (5 patients out of 142), although the possibility that there were more instances that might have been missed because of the brevity of the procedure must not be discounted. Some patients developed a tachycardia with both types of vaporizers. Such is, of course, common in light anesthesia with most general anesthetics. The most significant observation was bradycardia in 22 of 142 patients on whom the Fluotec was used and 6 of 50 patients on whom the Trimar vaporizer was used. This could point only to an active vagotonic action or a direct depressant effect of the myocardium, or both. Most investigators have been impressed with this finding and more or less agree on the vagotonic mechanism. Atropine alleviated this action of halothane to some extent. Cessation of administration, of course, was the other effective alternative for mitigating it. Hypotension was not as frequent as bradycardia. Incidentally, our series did not show a direct correlation between the occurrence of bradycardia and hypotension. Perhaps the contention[6,7] that hypotension was caused by a direct depression of the myocardium might serve to explain this. These effects also were similar to the action of both cyclopropane and chloroform on the cardiovascular system.

Nausea and vomiting on recovery (Table 4) compared favorably in degree of incidence with other agents. We believe, however, that greater proficiency and experience with the use of this drug might have diminished the incidence of nausea and vomiting. A recent study showed a very low incidence—4.7 per cent for both nausea and vomiting and 3.2 per cent for just nausea.[4]

Table 5 • Patient reaction as reported by mail

	Fluotec (142 patients)	Trimar (50 patients)
Pleasant	72 patients	33 patients
Unpleasant	5 patients	1 patient

Here is a drug which satisfies many of the requirements of an ideal anesthetic drug except its toxicity, especially for office procedures. It is a potent, rapid, nonirritating, nonflammable and pleasant anesthetic. Its pleasantness combined with its extreme potency added up to a dangerous combination. We feel that this agent may be hazardous in the hands of the anesthesiologist who has not been sufficiently trained in its use. Just as with cyclopropane and chloroform, adequate instruction and supervision should first be given to the anesthesiologist.

CONCLUSIONS

1. Halothane is a potent, rapid-acting, pleasant, nonflammable, nonirritating anesthetic vapor of probable great value in dental anesthesia.

2. The Fluotec is an efficient apparatus for vaporizing halothane. The ordinary Trimar vaporizer also is capable of vaporizing halothane sufficiently for anesthetic purposes, although probably not to the same degree of efficiency as the Fluotec.

3. The signs of toxicity of this drug are best seen in the cardiovascular system, in the form of arrhythmias, bradycardia and hypotension.

4. The administration of this drug at present should be restricted to the anesthesiologist who has been trained, under proper supervision, in its use.

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Endogenous tooth movement

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The three types of endogenous tooth movement are (1) the continuous eruption of teeth, (2) migration due to inherent weakness of the attachment apparatus, and (3) the adaptive movements of the teeth. Adaptive tooth movement is controlled by: (1) the contact relationships between adjacent and opposing teeth, and (2) the interaction of the components of the masticatory musculature. Knowledge of the various patterns of tooth movement is important to the practice of all phases of dentistry.

Tooth movement is important to all phases of dentistry. In the past, its study has been associated primarily with the practice of orthodontics. Recently, however, increased knowledge of the various nuances of tooth repositioning has enabled each branch of dentistry to appreciate its relationship to the problem. For example, the placement of a restoration in a single tooth can induce movement either of that tooth or of opposing teeth if the restoration is not in harmony with its environment. Further, a partial denture may create a change in tooth position as a result of torque from a clasp, from excessive pressure against contiguous teeth or as a result of ridge resorption under the saddle areas.[1] The extraction of a tooth will create space into which neighboring teeth can migrate unless prevented by some obstructive force such as steep intercuspation. All these situations can lead to periodontal destruction in the region and additional mobility of teeth.

Two types of tooth movement have been observed; one is the result of forces produced by an external mechanism or appliance which is introduced into the oral cavity. This may be called exogenous tooth movement. The force may be a short sudden one, as with a blow, or may be a series of longer intermittent ones as observed when an orthodontic appliance is used or when a habit such as thread-biting or pencil-biting is practiced. Only those habits which include the introduction of an extraoral object into the mouth may be considered as capable of producing exogenous movement.[2]

The second type of tooth movement is the result of forces produced by mechanisms from within the oral cavity. This is

endogenous tooth movement. Examples are the continuous eruption of teeth, migration due to an inherent weakness in the attachment apparatus of the tooth as seen in periodontosis, and the adaptive movements resulting from interocclusal contacts and muscular activity. No direct external moving force has been applied to these teeth. Movement following the reshaping of teeth by grinding or the removal of granulomatous tissue from a periodontal pocket is endogenous in character because here the change in tooth position is primarily the result of a change in the contact relationships of the teeth or in the surrounding periodontal structures. The instruments used, namely the grinding stone and the curet, do not in themselves exert force, as would be the case in exogenous tooth movement, but they do aid in changing the functional environment of the tooth. The condition of the teeth, the periodontium, and the surrounding oral mucosa which results from all constitutional, physiologic and pathologic factors may be called the functional environment.

The many varieties of endogenous movements may be grouped into three distinct patterns. The first is the response to a systemic regulatory mechanism. The second is the result of the failure of a weakened attachment apparatus to support the tooth properly in its alveolus. The third type is an adaptive one, activated and controlled by contact relationships between adjacent and opposing teeth, by the interaction of the various components of the masticatory musculature, and by the effect of the movement pattern of the mandible as governed by the temporomandibular joint, the musculature and the teeth.

TOOTH ERUPTION

The first type of endogenous movement, that governed by a systemic regulatory mechanism, is seen in the phenomenon of tooth eruption. Here an unknown catalyst, possibly endocrine in nature, stimulates the developing tooth to move occlusally until contact with its antagonist is made. Despite strong opposition this same force may continue throughout the life of the tooth, moving it occlusally as its morsal surfaces are worn. If the antagonist is lost, thereby removing the inhibiting effect, the eruptive force again may elevate the tooth until the opposing gingiva prevents further movement (Fig. 1). Frequently, however, the unopposed tooth will cease moving before the opposite gingiva is reached, indicating that possibly the eruptive force is no longer operable. Moreover, the cessation of continuous eruption after apparent removal of the obvious deterrent may also be the result of ankylosis of the tooth in its socket, bulbous root formation, a powerful biting

Fig. 1 • Strength of eruptive force of adult dentition. Above: Unopposed mandibular third molar which is extruded far beyond occlusal level of adjacent teeth. Below: Unopposed maxillary first molar has extruded despite restraining effect of contact with adjacent teeth

habit such as pipestem biting or tongue thrusting, or a combination of tongue and cheek pressures. As the eruptive movement continues throughout life, the alveolar structures may grow with the tooth or the movement may be a simple extrusion without alveolar growth.

MIGRATION BECAUSE OF WEAKNESS OF PERIODONTIUM

The next type of endogenous movement is the extremely rare wandering of teeth observed in patients with precocious advanced alveolar atrophy or periodontosis.[3-5] Glickman[6] states that this may result from "degeneration of the periodontal fibers, inadequacy in the continuous deposition of cementum or loss of alveolar bone." The teeth which most frequently exhibit this type of migration are the maxillary and mandibular central and lateral incisors, although on occasion posterior teeth, particularly the maxillary and mandibular first molars, may be similarly affected. Once the primary periodontal defect has occurred, secondary factors such as occlusal trauma, habits, and exuberant granulomatous tissue in a periodontal pocket may cause further migration. It is important to differentiate between this type of movement resulting from an intrinsic lack of tissue integrity modified by secondary factors, and types of movement showing similar clinical migration where the initiating factor is an abnormal habit or food impaction mechanism leading to periodontal destruction.[2]

ADAPTIVE TOOTH MOVEMENT

Adaptive tooth movement occurs as a result of physiologic accommodation to the forces of interocclusal contact and muscular activity. When these forces exceed physiologic limits, destruction of the supporting tissues occurs. From this point on, the tooth will exhibit perceptible mobility, and will have lost its adaptability to its environment. This may be a reversible reaction. If the tooth moves away sufficiently from the force which originally induced the movement, or if the forces themselves are reduced, the tooth may again become firm in its socket. This would indicate a regaining of adaptation. If the tooth cannot move out of the orbit of these traumatic forces, mobility will increase as a result of the increased periodontal destruction.

Several examples of adaptive tooth movement have been noted; namely, the limited buccolingual rocking of a tooth in its alveolus during both masticatory and nonmasticatory mandibular movement, the mesial drifting of teeth resulting from the anterior component of

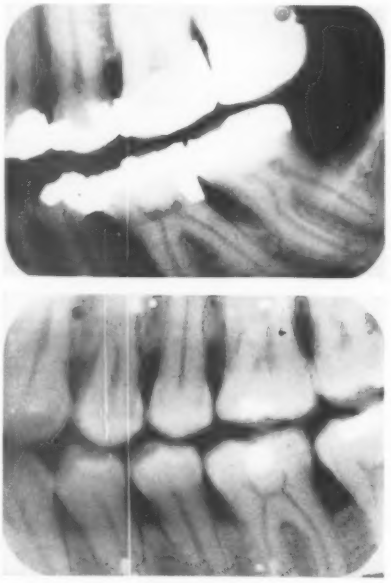

Fig. 2 • Various aspects of mesial movement of teeth. Above: Mesial inclination of mandibular molars can be seen. Their root spacing and curvature suggest a strong bracing effect which prevents excessive tooth movement. Below: Mesial inclination of both maxillary and mandibular teeth is seen. Angles at which teeth meet in centric occlusion are extremely important in producing subsequent movement of teeth.

Fig. 3 • Above: Mesial movement of both mandibular molars can be seen after loss of mandibular first molar. Maxillary first molar has extruded, demonstrating force of continuous eruption. Below: Adaptive tooth movement of mandibular teeth is noted after loss of mandibular first molar. Second molar has moved mesially and bicuspids have also shifted their positions. Latter change is indicated by open contact between cuspid and first bicuspid and by axial inclination of second bicuspid

force, the malpositioning of teeth due to blocking or moving occlusal interferences, and the reactive positioning of malposed teeth.

FUNCTIONAL ROCKING

Functional buccolingual rocking and depression of a tooth in its alveolus as a result of interocclusal contact is an adaptive physiologic activity. It is usually clinically imperceptible and is thought to be a protective mechanism, preventing the fracture of the tooth by the distribution of the effects of occlusal stress throughout the periodontium. If the effect of occlusal stresses exceeds that which can be tolerated by the periodontium and if gingival inflammation is present, damage may occur which implies loss of adaptation of the tooth to its environment.[1,7,8] Destructive changes on the pressure sides of the alveoli of experimental animals have been described as necrosis of the periodontal ligament fibers, thrombosis of the vessels in the ligament, and osteoclasis of the walls of the alveoli. The tension sides showed widening of the periodontal membrane, thrombosis and bone formation.[9-12] Stahl[13] recently described similar changes in a human periodontium where the occlusal force was directed against the crown of a molar tooth adjacent to the space of a previously extracted tooth. This force was directed primarily in the mesial direction and produced tipping which resulted in a definite pressure area on the mesial aspect and a definite tension zone on the distal aspect of the traumatized tooth. However, when intermittent tooth rocking occurs in a buccolingual direction as a result of mastication, swallowing or tensional clenching, and where alveolar support is insufficient, the destructive changes previously described will not have an opportunity to progress into the healing phase, and increased bone loss may occur. Inasmuch as excessive tooth rocking resulting from tensional clenching and grinding is observed so frequently, it is postulated that the resultant lack of periodontal healing combined with the bone loss associated with gingival inflammation is responsible for the bone loss in many persons with chronic periodontal disease.

MESIAL AND DISTAL MOVEMENTS

Mesial drifting of teeth due to the anterior component of force is the next type of endogenous tooth movement which results from the interplay between interocclusal contacts and masticatory musculature (Fig. 2, 3).[14] Although mesial drifting is observed with the great ma-

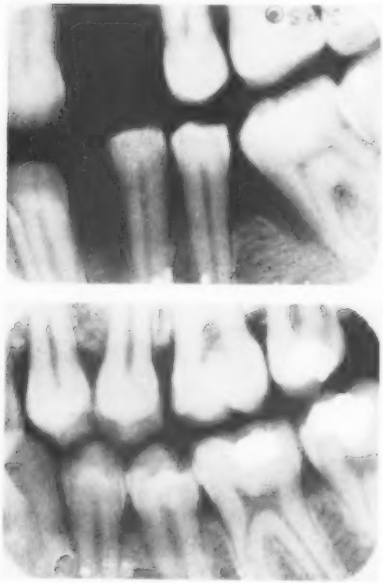

Fig. 4 • Above: Adaptive spacing and drifting of teeth is seen after developmental malpositioning of bicuspids and loss of mandibular first molar. Below: Insufficient space in arch has prevented the mandibular second bicuspid from erupting into its proper position. Resultant intermaxillary cuspal relations have prevented mesial movement of maxillary molars. This interference has created the open contact between maxillary second bicuspid and first molar

jority of teeth, certain factors may be present which do not permit this to occur in all instances. When contact is broken after the loss of a tooth, this force is no longer operable. A single unopposed tooth will not migrate mesially but will move occlusally or remain more or less constant in its position. With the loss of a mandibular first molar, the adjacent mandibular first and second bicuspids frequently will move distally (Fig. 4, above). Similarly, a maxillary second molar frequently will move distally after the extraction of the adjacent third molar. Another example of distal movement is seen where steep plunger cusps, the result of excessive tensional clenching, wedge opposing teeth apart and produce open contacts and posterior displacement of teeth (Fig. 4, below). Frequently, elimination of the steep inclines by cuspal reshaping will permit the teeth once again to approximate one another. Therefore, so-called mesial drifting is not the result of a systemic regulatory mechanism, but is rather the result of intercuspal and muscular pressures. In addition, the anterior movement is not universally present, but rather is seen only with an intact arch or arch segment (Fig. 5).

Fig. 5 • Adaptive tooth movement is noted in both mandible and maxilla. Loss of maxillary second bicuspid and mandibular first molar has produced distal movement of maxillary first bicuspid and mesial movement of maxillary first molar and mandibular second and third molars. This demonstrates that movement is a reaction to specific forces and does not always occur in mesial direction

MALPOSITIONING OF TEETH

Malpositioning is another type of adaptive tooth movement to be considered (Fig. 6, above left and below left; Fig. 7, above left and below left). A tooth may be out of normal alignment as a result of either a developmental or an acquired defect. Malpositioned tooth buds and an uncoordinated eruptive pattern between maxillary and mandibular teeth are two possible mechanisms of developmental malpositioning.[15]

Developmental deviations of tooth bud position may result in:

1. Spacing between two or more teeth.
2. Labial, buccal, lingual, mesial, distal, infraclusal or supraclusal positioning of one or more teeth.
3. Rotational deviation of a tooth.

A faulty eruptive pattern may produce:

1. Cross-bite between maxillary and mandibular teeth.
2. Lingual version of a mandibular posterior tooth where the buccal cusps are lingual to the lingual cusps of its antagonist.
3. Supraclusion of one tooth and infraclusion of its opposing member.
4. Labial, lingual, mesial, or distal positioning of a mandibular or maxillary tooth due to crowding, resulting either from premature loss or prolonged retention of a deciduous tooth affecting the ultimate position of its permanent counterpart. It also may result from insufficient room in the mandible or maxilla to accommodate the entire dentition.[15]

Malpositioned teeth may show considerable mobility after occlusal contact is established, primarily as a result of rocking during the various mandibular excursive movements. Tooth movement is also seen associated with malpositioning after an acquired disability such as the extraction of a tooth with resultant shifting of the adjacent and opposing teeth or by the adoption of any habit producing excessive occlusal wear. Tensional clenching and bruxism may cause spacing as a result of the wedging action of steeply worn cuspal inclines and ridges.

A malpositioned tooth may be considered as successfully adapted to its functional environment if it becomes firmly anchored in a healthy periodontium, even though it is malaligned. However, if mobility and concomitant signs of periodontal breakdown continue, it must be recog-

Fig. 6 • Woman, aged 40. Developmental malpositioning and subsequent reactive positioning of right and left maxillary and mandibular cuspids after complete periodontal therapy. In addition, a reduction in degree of overbite is noted. No orthodontic aids were used to produce tooth movement

Fig. 7 • Man, aged 28. Developmental malpositioning and subsequent reactive positioning of right maxillary lateral incisor after complete periodontal therapy. No orthodontic aids were used to produce tooth movement.

nized that adaptation is lacking and a pathologic condition exists.[7]

REACTIVE POSITIONING

The final type of adaptive tooth movement is reactive positioning (Fig. 6, above right and below right; Fig. 7, above right and below right).[15,16] This refers to the inherent tendency of malposed teeth to assume a new position in the dental arch with the elimination of the forces which originally induced the malalignment. The new position is usually more favorable than the one which existed prior to therapy. However, it has been observed recently that an intermediate position may be reached prior to the final repositioning. This intermediate position may produce an interceptive contact during any of the mandibular movements and thus may create an unstable occlusion. Therefore, the forces which prevent the desired repositioning of the affected tooth must be recognized and eliminated in order to permit the ultimate favorable solution. A typical example of such an interfering mechanism is seen when increased sensitivity of a partially adjusted tooth may cause the patient to avoid the affected side, thereby inducing unilateral function.[1] The teeth on the unused side have been observed to extrude, thereby preventing harmonious bilateral function during the various mandibular movements. Only after the involved surfaces have been adequately desensitized and reshaped will the ultimate favorable position of the teeth be reached.

The process whereby reactive positioning occurs involves continuous tooth eruption, integrated action between the tongue, cheeks and other elements of the masticatory musculature, and favorable

interocclusal contact relationships as governed by the movement patterns of the mandible. Therapy required to induce reactive positioning includes all necessary procedures to eliminate the cause and effect of the disease process, as would be necessary for any patient with periodontal disease not possessing malposed teeth. However, additional emphasis must be placed on the phase of occlusal reshaping so that the tooth movement may be anticipated, observed and directed.

Several treatment considerations are vital to successful reactive positioning:[15]

1. Occlusal trauma as either a primary or secondary factor usually contributes to acquired tooth malpositioning. Pocket formation with its concomitant exuberant granulomatous tissue formation also may be important in promoting pathologic tooth migration. From the clinical viewpoint, however, it would seem that pocket formation by itself produces tooth malalignment much less frequently than does the combination of occlusal trauma and pocket formation.

2. Sufficient mesiodistal space must exist to receive the malposed tooth.

3. The blocking forces must be reduced or eliminated in order to allow for movement.

4. Sufficient tooth structure must remain after the reshaping of the blocking force.

5. Routine periodontal therapy plus occlusal equilibration must be utilized in order to realize maximum results.

6. Varying degrees of reactive positioning are possible rather than only an all-or-none response to the removal of the disruptive force.

7. Occlusal adjustments must be repeated as the malposed teeth move into new positions to achieve the most favorable results.

8. Reactive positioning may be anticipated either in the presence or absence of mobility of a malposed tooth. However, although repositioning is easily induced in an extremely mobile tooth, its postpositioning prognosis is less favorable unless it can be adequately stabilized after treatment.

SUMMARY

1. Knowledge of the various patterns of tooth movement is important to the practice of all phases of dentistry.

2. Endogenous tooth movement refers to all types of tooth movement which are primarily the result of intrinsic local or systemic regulatory mechanisms.

3. Exogenous tooth movement implies that the movement follows the application of force by an extrinsic object or appliance.

4. Endogenous tooth movement may result from either physiologic or pathologic forces.

5. There are three primary patterns of endogenous tooth movement: the response to a systemic regulatory mechanism (tooth eruption); the result of failure of a weakened attachment apparatus to support a tooth properly in its alveolus (migration as seen in periodontosis); and the result of adaptation of a tooth to its functional environment. Adaptive tooth movement is controlled by the contact relationships between adjacent and opposing teeth, by the interaction of the various components of the masticatory musculature, and by the effect of the movement pattern of the mandible as governed by the temporomandibular joint, the musculature and the teeth.

6. Four examples of adaptive movement are observed; namely, functional rocking during masticatory and nonmasticatory mandibular movements, mesial drifting resulting from the anterior component of force, malpositioning of teeth due to developmental or acquired factors, and the reactive positioning of malposed teeth.

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Compressive properties of hard tooth tissues and some restorative materials

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Improved methods of preparing and testing specimens of hard tooth tissue to determine their modulus of elasticity, proportional limit and strength have yielded more precise data than were hitherto available. The compressive properties of enamel appear to depend on the orientation of the specimens in the tooth. Enamel is stiffer than dentin. The compressive properties of deciduous enamel and dentin are similar to those of enamel and dentin from permanent teeth. The stiffness of enamel is higher than that of the restorative materials tested, with the exception of the medium and hard inlay casting gold alloys.

A knowledge of the compressive properties of hard tooth tissues may be of assistance in designing cavity preparations, in evaluating dental filling materials, in demonstrating possible physical changes in teeth with age, in pulp disease and death and in different environments of development. A review of previous determinations of compressive properties of hard tooth tissues was presented in 1958.[1] At about the time of that report data were published by Craig and Peyton[2] on the elastic and mechanical properties of human dentin giving values of 2.4×10^6 to 2.7×10^6 psi for modulus of elasticity, 24,200 psi for proportional limit and 43,100 psi for compressive strength. These

values agree within experimental limits with those obtained at the National Bureau of Standards by Stanford and others[1] in 1958. Results from a recent study by Tyldesley[3] show values of 1.79×10^6 psi for modulus of elasticity and 38,800 psi for compressive strength for dentin. These values agree also within experimental limits with those of Stanford and others[1] and Craig and Peyton.[2] However, the value for proportional limit (9,600 psi) of dentin as well as the values of 19×10^6 psi for modulus of elasticity and 11,000 psi for proportional limit and compressive strength of enamel differ significantly from those obtained in this study. The use of compound specimens (part enamel and part dentin) by Tyldesley and the use of a transverse bend test to determine deformation under load instead of a compressive loading system may account for these differences.

This paper presents more precise data on the compressive properties (modulus of elasticity, proportional limit and strength) of hard tooth tissues and restorative materials obtained on small specimens that were prepared by an improved method.

PREPARATION OF SPECIMENS

Cylindrical specimens were prepared from enamel and dentin from different regions in the same teeth, different orientations of the structure, deciduous teeth, pulpless teeth, teeth of different ages and teeth from an endemic area of fluorine (fluoride ion).

The teeth from which the specimens were to be prepared were sectioned into blocks of tissue which were subsequently mounted in small collets in the jeweler's lathe shown in Figure 1. Diamond instruments mounted in a hydraulic handpiece (Fig. 2, A) were utilized as the cutting tools. A fine spray of water (B) was provided for lubrication and cooling during the cutting operation. The combined free running speed of rotation of the diamond instrument and block of tooth structure (C) was approximately 55,000 rpm. Light cuts (about 0.005 in. depth of cut) were made across the end of the block in order to true that end so that it would be perpendicular to the sides of the finished cylinder. Part of the block was then ground to a cylindrical shape. At this point the specimen was removed from the collet and turned end for end so that the excess tissue could be removed and the other end of the specimen made plane and perpendicular to the axis of the cylinder. The specimens were placed in distilled water until tested. Because of the extreme brittleness of enamel, it is very difficult to make perfect cylinders even with the refined method of preparation. The data which appear in this report were determined on specimens of enamel that showed no visible chipping or fractures under approximately 30 times magnification. The number of specimens accepted and tested was less than 50 per cent of those prepared.

The cylindrical specimens of restorative materials, approximating the sizes of the specimens of tooth structure, were fabricated in various ways. Those of three brands of silicate cement and the direct resin filling material were prepared by the method for compressive strength tests outlined in American Dental Association Specification No. 9 for dental silicate cement.[4] Specimens of three brands of zinc phosphate cement were prepared by the method outlined in American Dental Association Specification No. 8 for dental zinc phosphate cement.[5] The plastic teeth were sectioned into rectangular blocks which were then reduced to cylindrical specimens on the lathe. The three dental amalgam alloys were mixed and packed following the respective manufacturer's directions as closely as conditions permitted. The specimens of the hard, medium and soft inlay casting gold alloys were prepared from cast rods. The rods were cut into appropriate lengths and then reduced in dimensions on the lathe.

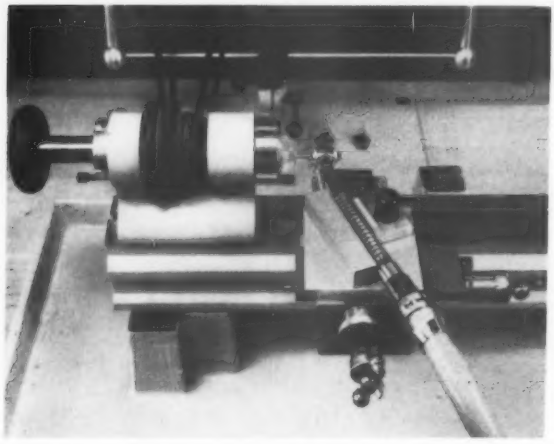

Fig. 1 • Jeweler's lathe and hydraulic handpiece

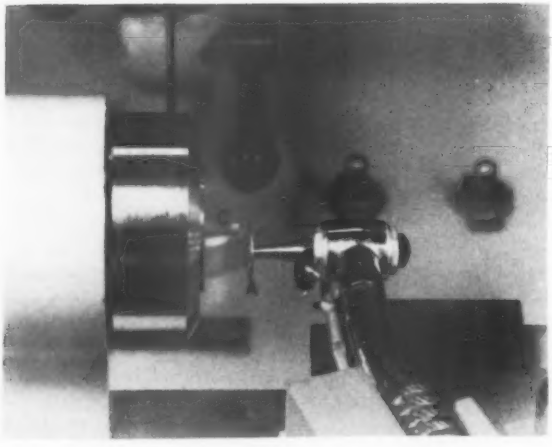

Fig. 2 • Close-up of cutting area

All gold alloy specimens were tested in the annealed condition; that is, quenched in water at room temperature after being held at 1290°F. for ten minutes. With the exceptions of the inlay casting gold alloys and the plastic teeth, all of the restorative materials were tested for their compressive properties from one to two weeks after preparation.

In addition to refining the method for preparing cylinders of hard tooth tissues, the testing equipment previously described was replaced by one having a more sensitive loading device (Fig. 3, left). A close-up of the rigid platen arrangement is shown in Figure 3, right. The application of load below the proportional limit was at speeds of 0.001 to 0.002 in. per minute. As previously reported in measuring the strain, the small

size of the specimen (Fig. 3, right, A) made it necessary to fasten the Tuckerman Strain Gauges (B) to the platens (C). The measurement of deformation in the specimen included the deformation in the portion of the steel platens within the gauge length and the errors due to foundation or end effects. The elastic deformation in the platens can be corrected for by the following equation, the derivation of which can be found in the previous report:[1]

$$\triangle = Z - \frac{P}{E_P}\left[\left(\frac{L_g - L_s}{A_p}\right) + \frac{2}{d_s}\right]$$

where:

$\triangle$ = corrected deformation
Z = observed deformation
P = load
L_g = gauge length of strain gauge
L_s = length of specimen
E_P = modulus of elasticity of the steel platen
d_s = diameter of specimen
A_P = cross sectional area of platen

Thus, the corrected strain, ϵ, $= \frac{\triangle}{L_s}$, and the modulus of elasticity of the specimen is given by the following equation:

$$E_s = \frac{P}{A_s \epsilon}$$

In order to verify experimentally the accuracy of the testing equipment and the correction procedure, cylinders approximating the size of tooth tissue specimens were prepared from a magnesium alloy, AZ31A; an aluminum alloy, 2024-T4, and poly (methyl methacrylate). These cylinders were tested in compression and the results corrected according to the previously mentioned equation. Moduli of elasticity were also determined in tension on rods of these three materials. The values for uncorrected moduli in compression, corrected moduli in compression, observed moduli in tension and published moduli are given in Table 1.

Examination of Table 1 shows that the corrected values of moduli in compression

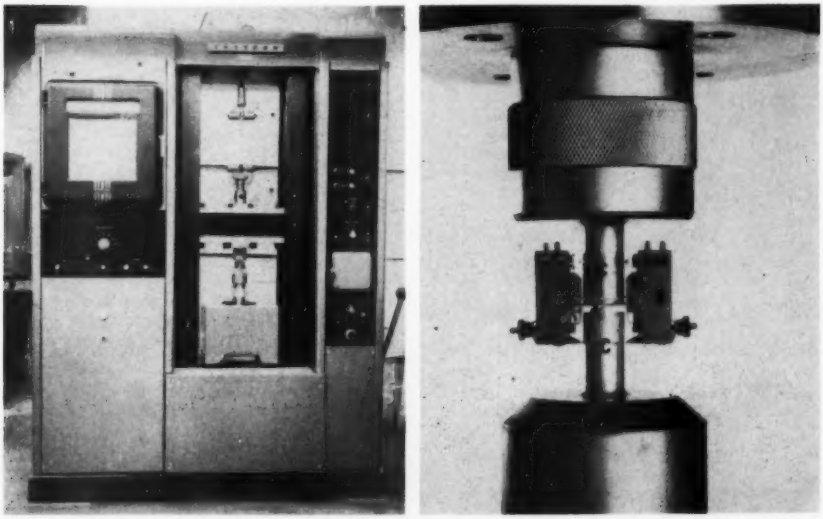

Fig. 3 • Left: Testing machine. Right: Close-up of testing area. A: Tooth specimen. B: Strain gauges. C: Platens

Table 1 • Calibration data for determination of modulus of elasticity

Material	Average dimensions of specimens		Uncorrected E compression	Corrected E compression	Observed E tension	Published E
	Length	Diameter				
	in.	in.	10^6 psi	10^6 psi	10^6 psi	10^6 psi
Poly (methyl methacrylate)	0.130	0.061	0.47	0.48	0.45	0.45*
Magnesium alloy, AZ31A	0.131	0.060	5.1	6.5	6.5	6.5†
Aluminum alloy, 2024-T4	0.075	0.040	7.9	10.8	10.5	10.6†

*Source: Modern Plastics, encyclopedia issue, 1959.
†Source: Metals handbook, The American Society for Metals, 1948.

agree within experimental limits with the published values. In the previous report[1] the corrected values for moduli in compression did not agree with the observed values in tension or the published values. This was attributed to end effect or apparent shortening due to imperfect contact of ends of specimens with the platens and to other experimental errors.

Parallelism of the ends of the specimens was randomly checked by an electronic gauge system. The maximum degree of nonparallelism of the ends was 0.0002 inch. Therefore, it is believed that the refined methods of preparing and testing the extremely small specimens has largely eliminated the gross differences in corrected and published values for moduli previously obtained.

DISCUSSION OF RESULTS

The results for the compressive properties of the hard tooth tissues appear in Tables 2 through 8. The data for dentin taken from the coronal portion of molars, bicuspids, cuspids and incisors (Table 2) show that, in general, no significant differences in modulus of elasticity, proportional limit and compressive strength

Table 2 • Compressive properties of dentin

Type of tooth	Location of specimens	No. of specimens	Average dimensions of specimens		Compressive property determined*			
					Modulus of elasticity		Proportional limit	Strength
			Length	Diameter	(a) Uncorrected	(b) Corrected†		
			in.	in.	10^6 psi	10^6 psi	psi	psi
Molars	Crown	37	0.100	0.050	1.6 ± 0.3	1.7 ± 0.3	$21,500 \pm 3,000$	$44,200 \pm 8,500$
	Root	21	0.057	0.037	1.0 ± 0.4	1.1 ± 0.4	$15,600 \pm 5,700$	$36,300 \pm 8,700$
Bicuspids	Crown	9	0.112	0.054	1.8 ± 0.1	2.0 ± 0.1	$21,200 \pm 2,500$	$36,000 \pm 1,500$
	Root	22	0.061	0.041	1.2 ± 0.3	1.3 ± 0.3	$16,000 \pm 5,500$	$33,500 \pm 5,500$
Cuspids	Crown	10	0.075	0.039	1.8 ± 0.9	2.0 ± 0.9	$20,300 \pm 2,200$	$40,100 \pm 10,500$
	Root	18	0.074	0.040	1.6 ± 0.4	1.7 ± 0.4	$16,200 \pm 4,900$	$31,500 \pm 3,700$
Incisors	Crown	9	0.098	0.060	1.7 ± 0.6	1.9 ± 0.6	$18,000 \pm 3,800$	$33,700 \pm 3,000$
	Root	12	0.060	0.036	1.3 ± 0.3	1.4 ± 0.3	$12,500 \pm 3,500$	$33,800 \pm 9,600$

*Degree of variation is expressed as standard deviation:

$$\sigma = \sqrt{\frac{\Sigma x^2 - n\bar{x}^2}{n-1}}$$

†Modulus of elasticity corrected for elastic shortening of the platens and deformation of the platen surfaces.

can be attributed to a particular type of tooth. The averages of results obtained appear to indicate that root dentin has a lower modulus (1.4×10^6 psi) than does coronal dentin (1.9×10^6 psi). Also root dentin, in general, exhibits a lower proportional limit and compressive strength than coronal dentin. However, when the ranges of values determined are examined, the differences cited may not be significant.

Enamel (Table 3) taken from the cusp of cuspids (Fig. 4, A) exhibited higher modulus of elasticity, proportional limit and compressive strength than enamel from the incisal edge (B). The values for the properties determined on specimens of enamel from the labial side (C) have intermediate values. There appeared to be an increase in the stiffness (modulus of elasticity) for severely mottled enamel from the cusp or labial side of cuspids from patients living in an endemic area of fluorine (fluoride ion). The results for enamel taken from the incisal edge showed no difference in modulus when the environment of development is examined. The data appear to warrant further investigation of this factor.

Fig. 4 • Bicuspid. A: Cusp. B: Incisal edge. C: Labial side

In addition, specimens of enamel were taken from molars (Table 4). The data show that enamel from the cusp (C) and side (D) of molars exhibits about the same properties as does that from cuspids (Fig. 5). The low modulus, propor-

Table 3 • Compressive properties of enamel (cuspids); environment of development

Location	Environment	No. of specimens	Average dimensions of specimens		Compressive property determined*			
					Modulus of elasticity		Proportional limit	Strength
			Length	Diameter	(a) Uncorrected	(b) Corrected†		
			in.	in.	10^6 psi	10^6 psi	psi	psi
Cusp	No fluorine	7	0.045	0.036	5.2 ± 0.6	6.9 ± 0.8	28,200 ± 2,700	41,800 ± 6,900
	Endemic fluorine	5	0.041	0.036	7.0 ± 1.4	9.1 ± 1.8	23,800 ± 1,400	35,400 ± 1,200
Labial side	No fluorine	6	0.037	0.028	3.7 ± 0.3	4.8 ± 0.3	26,600 ± 1,800	36,700 ± 5,100
	Endemic fluorine	5	0.040	0.032	4.6 ± 0.3	6.0 ± 0.3	22,800 ± 3,000	33,200 ± 6,700
Incisal edge	No fluorine	4	0.033	0.032	2.4 ± 0.7	2.9 ± 0.9	13,200 ± 1,500	31,900 ± 1,900
	Endemic fluorine	3	0.036	0.034	2.4 ± 0.8	2.9 ± 1.1	15,000 ± 2,500	37,300 ± 4,700

*Degree of variation is expressed as standard deviation.
†Modulus of elasticity corrected for elastic shortening of the platens and deformation of the platen surfaces.

tional limit, and compressive strength for enamel taken from transverse sections (F, sections parallel to the occlusal plane) of the teeth appear to agree well with those of occlusal enamel taken from longitudinal sections (E, sections perpendicular to the dentinoenamel junction). This would confirm the previous observations[1] if it is assumed that the general direction of the enamel rods in specimens taken from these two regions would be in the direction of the axis of the cylinders and if the primary failure were in the bonding material. It is noted that the longitudinal axis of the cylinder was parallel to the plane of the section.

Dentin was also examined from the standpoint of environment of development. The results (Table 5), as might be expected, show no significant differences in respect to the three physical properties determined.

To determine the effect of the death of the pulp on the compressive properties of hard tooth tissues, three pairs of corresponding vital and pulpless incisors (condition cited was at time of extraction) were utilized. The patients from whom these teeth were extracted were 30 years of age or younger. The times of death of the pulps were not available.

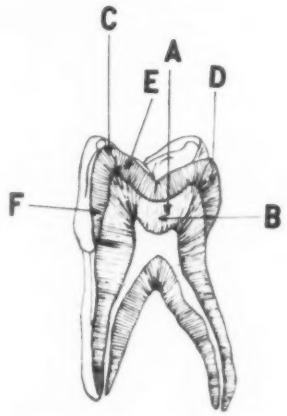

Fig. 5 • Molar. A: Longitudinal sectioning of dentin. B: Transverse sectioning of dentin. C: Enamel, cusp. D: Enamel, side (longitudinal sectioning). E: Enamel, occlusal. F: Enamel, side (transverse sectioning)

The coronal portions of the pulpless teeth were carious or largely artificially restored so that only the root portion could be used for comparison with the roots of vital incisors. The data (Table 6) show no significant differences when the results for the corresponding physical properties are compared. It is possible that the time between death of the pulp

Table 4 • Compressive properties of enamel (location and orientation) (molars)

Location	Orientation	No. of specimens	Average dimensions of specimens		Compressive property determined*			
					Modulus of elasticity		Proportional limit	Strength
			Length	Diameter	(a) Uncorrected	(b) Corrected†		
			in.	in.	10^6 psi	10^6 psi	psi	psi
Cusp	Longitudinal	19	0.061	0.039	5.0 ± 0.6	6.7 ± 0.7	32,500 ± 3,700	37,800 ± 6,000
Side	Longitudinal	11	0.058	0.038	3.7 ± 0.4	4.7 ± 0.6	27,000 ± 2,500	34,600 ± 4,300
	Transverse	16	0.041	0.033	1.3 ± 0.3	1.4 ± 0.5	10,200 ± 3,200	13,700 ± 4,700
Occlusal surface	Longitudinal	6	0.043	0.031	1.6 ± 0.3	1.8 ± 0.5	14,300 ± 3,700	18,400 ± 4,400

*Degree of variation is expressed as standard deviation.
†Modulus of elasticity corrected for elastic shortening of the platens and deformation of the platen surfaces.

Table 5 • Compressive properties of dentin; environment of development

Environment	No. of specimens	Average dimensions of specimens		Compressive property determined*			
				Modulus of elasticity		Proportional limit	Strength
		Length	Diameter	(a) Uncorrected	(b) Corrected †		
		in.	in.	10^6 psi	10^6 psi	psi	psi
No fluorine	15	0.075	0.039	1.8 ± 0.4	1.9 ± 0.7	18,800 ± 3,100	38,300 ± 9,600
Endemic fluorine	8	0.063	0.040	1.6 ± 0.3	1.7 ± 0.3	20,000 ± 4,200	35,900 ± 11,000

*Degree of variation is expressed as standard deviation.
†Modulus of elasticity corrected for elastic shortening of the platens and deformation of the platen surfaces.

and extraction may have been too short for sufficient physical changes to have taken place which would be revealed by these tests.

The compressive properties of enamel and dentin taken from three deciduous molars were also determined. The data (Table 7) show that enamel specimens taken from the cusps exhibit higher stiffness (modulus of elasticity), proportional limit and compressive strength than those taken from the buccal side. The values for the three properties determined on deciduous enamel agree very well, as do the values for deciduous dentin, with values for these two issues from permanent teeth (Tables 2 and 3, respectively).

No attempt had been made to determine tubule direction in the specimens of coronal dentin as there did not appear to be any significant differences in values determined for the various types of teeth (Table 2). However, specimens were taken from sections prepared longitudinally, that is, from the occlusal surface through the enamel into the coronal dentin to the pulp chamber of a molar (Fig. 5, A). In addition, specimens were taken from sections prepared transversely, that is, in the occlusal plane of another molar (Fig. 5, B). Both teeth were from the same patient. The data (Table 8) do not show significant differences in the values for the three properties; thus, the original orientations of the dentin in the teeth do not appear to influence the physical properties. This substantiates the conclusion reached by Craig and Peyton.[2]

The compressive properties of some restorative materials are shown in Table 9. The materials are arranged in increasing order of stiffness (modulus of elas-

Table 6 • Compressive properties of vital and pulpless incisors (root dentin)

Incisor	Number of specimens	Average dimensions of specimens		Compressive property determined*			
				Modulus of elasticity		Proportional limit	Strength
		Length	Diameter	(a) Uncorrected	(b) Corrected †		
		in.	in.	10^6 psi	10^6 psi	psi	psi
Vital	8	0.079	0.039	1.4 ± 0.7	1.5 ± 0.7	18,100 ± 1,900	30,000 ± 4,800
Pulpless	6	0.071	0.038	1.5 ± 0.2	1.6 ± 0.2	19,900 ± 2,200	32,600 ± 4,400

*Degree of variation is expressed as standard deviation.
†Modulus of elasticity corrected for elastic shortening of the platens and deformation of the platen surfaces.

Table 7 • Compressive properties of enamel and dentin (deciduous molars)

Tissue	Number of specimens	Average dimensions of specimens*		Compressive property determined*			
				Modulus of elasticity		Proportional limit	Strength
		Length	Diameter	(a) Uncorrected	(b) Corrected †		
		in.	in.	10^6 psi	10^6 psi	psi	psi
Enamel cusp	3	0.027	0.028	5.9 ± 1.0	7.7 ± 1.4	28,500 ± 800	42,300 ± 12,000
Buccal side	3	0.033	0.031	2.6 ± 0.9	3.4 ± 1.3	19,600 ± 6,300	22,600 ± 6,300
Dentin	5	0.076	0.039	1.7 ± 0.3	1.9 ± 0.3	22,900 ± 6,900	42,300 ± 9,800

*Degree of variation is expressed as standard deviation.
†Modulus of elasticity corrected for elastic shortening of the platens and deformation of the platen surfaces.

Table 8 • Compressive properties of dentin (orientation of specimens)

Teeth sectioned	Number of specimens	Average dimensions of specimens*		Compressive property determined*			
				Modulus of elasticity		Proportional limit	Strength
		Length	Diameter	(a) Uncorrected	(b) Corrected †		
		in.	in.	10^6 psi	10^6 psi	psi	psi
Transverse	5	0.084	0.041	2.0 ± 0.3	2.4 ± 0.3	24,400 ± 4,700	36,400 ± 3,100
Longitudinal	9	0.060	0.036	1.7 ± 0.5	1.9 ± 0.6	18,000 ± 4,000	33,700 ± 3,000

*Degree of variation is expressed as standard deviation.
†Modulus of elasticity corrected for elastic shortening of the platens and deformation of the platen surfaces.

Table 9 • Compressive properties of some restorative materials

Material	No. of specimens	Average dimensions of specimens*		Compressive property determined*			
				Modulus of elasticity		Proportional limit	Strength
		Length	Diameter	(a) Uncorrected	(b) Corrected †		
		in.	in.	10^6 psi	10^6 psi	psi	psi
Direct filling resin	10	0.214	0.122	0.27 ± 0.03	0.27 ± 0.03	6,400 ± 500	11,000 ± 400
Plastic teeth	10	0.120	0.058	0.36 ± 0.04	0.36 ± 0.04	7,500 ± 800	9,700 ± 1,200
Zinc phosphate cement	15	0.225	0.121	1.2 ± 0.3	1.3 ± 0.3	8,600 ± 600	12,000 ± 1,200
Amalgam	30	0.073	0.057	1.8 ± 0.4	2.0 ± 0.5	30,000 ± 6,100	57,800 ± 4,100
Silicate cement	15	0.202	0.121	2.0 ± 0.5	2.4 ± 0.6	16,400 ± 4,100	23,000 ± 6,700
Inlay golds							
soft	5	0.124	0.080	5.1 ± 0.2	6.5 ± 0.3	9,600 ± 900	—
medium	5	0.141	0.071	8.3 ± 0.6	11.3 ± 1.0	24,100 ± 1,500	—
hard	5	0.161	0.080	8.6 ± 0.2	11.8 ± 0.7	33,700 ± 3,700	—

*Degree of variation is expressed as standard deviation.
†Modulus of elasticity corrected for elastic shortening of the platens and deformation of the platen surfaces.

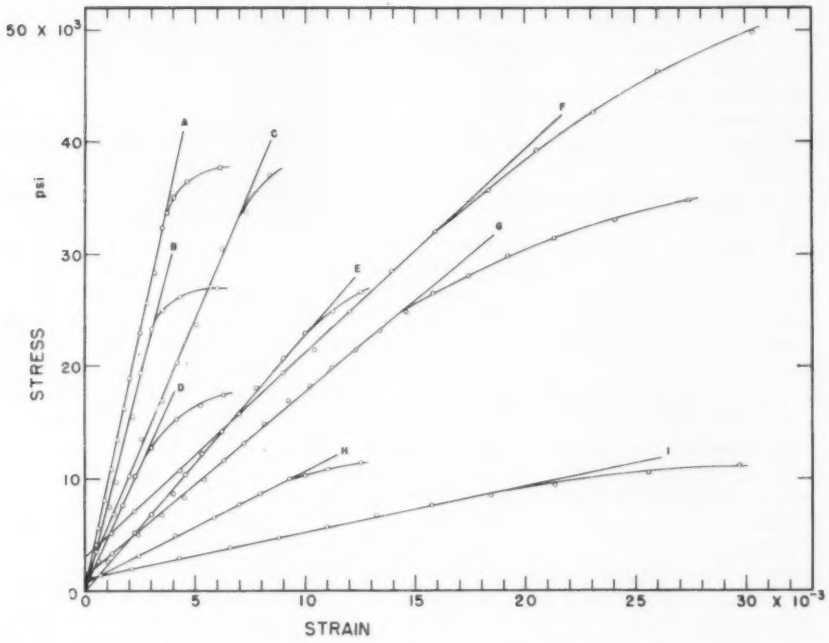

Fig. 6 • Typical stress-strain diagrams of tooth tissues and some restorative materials. A: Hard inlay gold alloy. B: Medium inlay gold alloy. C: Enamel, cusp. D: Soft inlay gold alloy. E: Silicate cement. F: Amalgam. G: Dentin. H: Zinc phosphate cement. I: Direct resin filling material

ticity). The stiffness and compressive strength of enamel and dentin are higher than those of the restorative materials tested, with the exceptions of amalgam and the medium and hard inlay casting gold alloys. No true compressive strengths of the inlay casting gold alloys could be determined as the specimens flattened into plates from plastic flow with constantly changing surface contact of the specimens with the platens. Although the stiffness of the silicate cement was of the same order as dentin, its proportional limit and comprehensive strength were lower.

Typical stress-strain diagrams which were determined experimentally for enamel, dentin and the restorative materials appear in Figure 6. The differences in stiffness of the tissues and restorative materials can easily be seen when one compares the slopes of the straight line portions of the stress-strain curves. The steeper the slope, the stiffer the tissue or material. A measure of the degree of brittleness can also be ascertained from these curves. When the stress-strain curve deviates from the straight line relationship, that is, when the increments of strain produced for equal increments of stresses are not constant, then the proportional limit of the material has been reached. Tougher materials such as amalgam (Fig. 6, F), inlay casting gold alloys (A, B, D), direct filling resin (I), zinc phosphate cement (H) and human dentin (G) exhibit greater plastic deformation than silicate cement (E) and enamel (C), specimens of which fracture soon after reaching the proportional limit, thus

showing a high degree of brittleness. (The extreme plastic deformation of the inlay casting gold alloys could not be plotted because of the constantly changing cross-sectional area making the calculations of applied stress impossible.)

SUMMARY AND CONCLUSIONS

1. Improved methods of preparing and testing specimens of hard tooth tissues have been developed for the determination of modulus of elasticity, proportional limit and strength in compression.

2. The values for the three compressive properties of dentin do not appear to be affected by the type of tooth or the original orientation of the dentin as to tubule direction. On the average root dentin appears to have lower values for compressive properties than does coronal dentin. However, the ranges of values for individual specimens of root and coronal dentin overlap.

3. The compressive properties of enamel appear to depend on the orientation of the specimens in the tooth. Enamel is stiffer (higher modulus of elasticity) than dentin and exhibits in some locations (cusp) a compressive strength equal to or similar to that of dentin. The present data do not warrant any definite conclusions as to the apparent increase in stiffness of enamel when taken from patients' teeth developed in an endemic area of fluorine (fluoride ion) over that from teeth where no fluorine was present during development.

4. No significant differences were found in the compressive properties of root dentin from vital and pulpless incisors.

5. The compressive properties of deciduous enamel and dentin are similar to those of the permanent tissues.

6. A comparison of the compressive properties of the restorative materials tested and the hard tooth tissues shows that the stiffness (modulus) of enamel is higher than that of the restorative materials tested, with the exception of the medium and hard inlay casting gold alloys. The compressive strength of dentin is higher than that of the restorative materials with the exception of amalgam.

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Conducted at the National Bureau of Standards in cooperation with the American Dental Association, the Army Dental Corps, the Air Force Dental Service, the Navy Dental Corps, and the Veterans Administration.

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Progress • A man who wants to remove a mountain begins by carrying away small pebbles. *Peter Abelard (1079-1142).*

reports of councils and bureaus

Association recommendations on fiscal 1961 appropriations for dental health and research activities of U. S. Public Health Service

COUNCIL ON LEGISLATION

On March 3, 1960, representatives of the Association presented testimony before a subcommittee of the House Committee on Appropriations concerning federal appropriations for dental activities during fiscal year 1961. The Association's witnesses recommended that approximately five million dollars be added to the President's budget for research, fellowship and training grant programs administered by the National Institute of Dental Research. Witnesses for the Association were Raymond J. Nagle, member of the Association's Council on Dental Education, and Alfred E. Smith, member of the Council on Legislation. The appropriations subcommittee is headed by Rep. John E. Fogarty (D., R.I.).

Mr. Chairman, members of the committee, I am Alfred E. Smith of New Orleans, La., a member of the American Dental Association's Council on Legislation. I am accompanied by Raymond J. Nagle, dean of the College of Dentistry of New York University; C. Willard Camalier, assistant secretary of the American Dental Association, and Mr. Hal M. Christensen, assistant secretary of the Association's Council on Legislation.

We are here today to present the American Dental Association's views and recommendations on fiscal 1961 appropriations for the dental health activities of the United States Public Health Service.

Despite the outstanding advances in the development of new technics and methods in the treatment and cure of dental disease, a reasonable measure of control over this near-universal affliction is still a far-distant possibility.

It would take the dental practitioners in this country 5 to 10 years merely to eliminate the backlog of dental ailments now afflicting the population. The out-of-pocket cost for such an undertaking would be from 10 to 20 billion dollars not taking into account the value of the directly related losses in working time and productivity. By adding to this the pain and suffering involved in thousands of cumulative

years of rampant tooth decay, periodontal disease and other oral afflictions, one can gain some idea of the dimensions of the dental disease problem in this country.

Obviously, the solution to the problem does not lie in the direction of conventional treatment of existing disease since neither sufficient manpower nor facilities are available; the solution lies in the discovery of new and dramatic means of prevention through research.

Bold and imaginative research planning and the tapping of additional new research resources are necessary.

The Association is prepared to offer to the committee certain recommendations for expanding the dental research program to bring it more closely in line with the problem we are facing.

The Association's principal witness is Raymond J. Nagle, dean of the College of Dentistry of New York University. Dr. Nagle is a member of the Association's Council on Dental Education and is president- elect of the American Association of Dental Schools. Dr. Nagle is especially qualified to speak on the subject of dental research both from direct experience as director and administrator of a large program at his own school and from his wide experience with dental research on a national basis.

TESTIMONY OF DR. NAGLE

Mr. Chairman, members of the committee, reference has been made to the unfortunate but well-established fact that the dental disease problem is growing at a much faster rate than our ability to arrest it through even the most modern treatment technics.

We are faced with a progressively widening gap in the ratio of dentists to population and, even assuming the establishment of several additional schools of dentistry, the rate at which dental practitioners can be trained and graduated will not approximate the projected rate of population growth. Thus, unless new methods of preventing dental disease can be found and unless existing dental manpower and facilities can be used on a broader and more efficient basis, there will be a constant increase in the amount of untreated dental disease and a steady decrease in the availability of dental treatment and care over many years to come.

The American Dental Association believes strongly that in order to do something effective about this problem, both long and short term, the total dental research effort must be expanded and accelerated significantly.

As previously pointed out, there can be no reasonable disagreement over the fact that in relation to the magnitude of the dental disease problem, the public and private expenditures for dental research are woefully small. The yearly bill for dental care in this country is about two billion dollars which is only a fraction of the total economic loss involved and represents treatment and care for less than half the people who need it.

Yet, despite the huge financial losses, the pain and suffering involved and the deleterious effect on the general health and well-being of the public, funds available for research into the nature and causes of dental diseases are not readily obtainable. This results in part from the fact that in the minds of many people, dental disease is a minor problem involving only an occasional toothache or other temporary discomfort; the dramatic characteristics that bring forth public and private philanthropy for diseases such as cancer, heart disease and mental illness are not present. This conception is unfortunate and to a large extent misguided. It overlooks the direct relationship between oral health and many systemic conditions. It also overlooks the fact that there are many debilitating and sometimes fatal oral diseases which are being subjected to intensive study by researchers working in many different areas.

For example, 12 per cent of all malignant growths occur in the mouth and many investigators in cancer research and dental research are engaged in studies that are complementary to each other. Similarly, subacute bacterial endocarditis after oral surgery is a serious condition of vital concern both to heart and dental research workers. Crippling congenital conditions such as cleft lip and palate receive the attention of teams of health scientists, including dentists, plastic surgeons, speech therapists, roentgenologists and many others. Other oral conditions, injuries and diseases frequently involve disfigurements which have extremely serious psychological and medical consequences. Much of the research on caries and periodontal diseases involves bacteriological studies that have broad application in many fields in addition to dental science.

The dental research involving periodontal disease is of exceptional public importance. It involves one of the most widespread infections known to man, and its effects on general health are barely beginning to be recognized. One writer has compared the oral tissues stricken by a common form of periodontal disease, or pyorrhea, to an area of 10 to 15 square inches on the back, arm, or other exposed part of the anatomy which emits pus constantly. He points out that periodontal disease afflicts 25 per cent of the adult population, causing untold sys-

temic disturbances and accounting for the annual loss of millions of teeth. At the present time some of the most promising research being conducted is in relation to periodontal disease. It is but one of the areas needing increased support and expansion.

The dental needs and conditions of the chronically ill and the institutionalized or homebound geriatric patient require more immediate and intensive investigation.

There is a need for further epidemiologic and experimental research on nutrition in relation to chronic dental diseases such as dental caries and periodontitis.

Germ-free animals have been used dramatically to disclose certain fundamental characteristics of dental disease that heretofore have evaded effective demonstration. There should be established more germ-free animal centers in which to expand the productive studies of dental disease.

Crystallographic studies have brought forth important new knowledge of the submicroscopic structure of teeth, bone and other body tissues. Additional facilities and highly trained specialists in this science are needed to explore these structures further and elucidate the nature of their normal development and their disease conditions.

Within the past year, there has been a remarkable development in the nature of a conceptual "breakthrough" in dental caries research. Experimental work utilizing the Syrian hamster was reported at the recent midwinter dental meeting in Chicago which presents strong evidence that dental caries is a transmissible disease, and that certain bacterial species are involved in its transmission from one individual to another. For the first time, we can envision a means by which dental caries can be wiped out by purging the entire population of the bacteria associated with it, perhaps by developing a widespread vaccination method as has been done with diseases such as smallpox and diphtheria. This, of course, at present is speculation and great distances must be covered before it can be determined whether such a possibility can be brought to realization. But a whole new approach has been opened up and it should be eagerly pursued.

All these things are mentioned, and many additional areas could receive special attention, to give further indication of the size and seriousness of this country's dental disease problem and the importance of dental research in the total health picture. The Association believes it is clear that despite the excellent dental research program that has been started and is underway at Bethesda and at virtually all of the country's dental schools, there is a long way to go in following up current investigations and expanding into new fields of inquiry. The Association believes that additional research, some of it of a broader more basic type than heretofore, is essential.

PROJECT GRANTS PROGRAM

Basic Dental Research in Nondental Institutions • Up to the present time, virtually all of the dental research effort has been placed in the dental schools. This has been a wise policy and has resulted in impressive advances in the short few years of its implementation.

Dental research talent naturally has concentrated in the schools where for years individuals have been highly trained for teaching, and it is only logical that the schools should be the primary source of progress in dental research. In turn, the financial support that has been made available for research in the schools has strengthened them and raised the general caliber of the dental education provided.

However, although research workers in dental schools have a certain advantage in being close to the clinical problems at which the research is aimed, there also are disadvantages. For example, under such circumstances there has been too little opportunity for research of a basic nature necessary to the exploration of the underlying fundamentals of dental health and dental science.

There is a great need for research inquiries that are prompted by pure scientific curiosity about phenomena in the dental field without foreseeable relation to any clinical problem or condition. Occasionally, investigators in dental institutions find time to conduct basic research of this kind. Generally, however, because of their special orientation and because of the pressing need for rapid and direct advance toward the solution of specific oral health problems, this kind of basic research must be laid aside for consideration at some indefinite future time. It is believed that such postponement is undesirable and unnecessary. There is a great amount of general research needed to be done which does not depend on the close association between scientists and clinicians that exists in dental institutions. It can be conducted by competent scientists with no prior connection with dentistry. There are large numbers of such scientists in liberal arts colleges and technical institutions all over the country who could be brought into this important research endeavor. With very little guidance and assistance, this virtually untapped reservoir of highly competent and qualified manpower could be utilized in health-related research.

Already, there are dental research projects in nondental institutions such as Stanford Uni-

versity, Western Biological Laboratory, Chicago Children's Memorial Hospital, Illinois Wesleyan University, the Age Center of New England, Rutgers University, Duke University, Michigan State University and others. Research scientists in these institutions, with a minimum of direction from specialized dental research workers, are conducting investigations of fundamental benefit to the further understanding of dental phenomena, both normal and pathologic. Additional, much needed personnel can be brought into the dental research picture if funds and facilities are made available to encourage them. The anticipated yield in terms of new knowledge and health-oriented researchers is vital to the growth of our dental research program.

The Association believes the project grant program also would be strengthened by implementation of the proposal to establish institutional grants to be used for assisting dental schools and related institutions. Such grants will permit the flexibility that is needed to initiate investigations in areas that may be difficult to delineate for regular grant applications but which nevertheless may prove to be extremely productive.

Dental Research in Regional Clinical Research Centers • Consideration might also be given to the development of centers where specifically oriented laboratory research, clinical studies and rehabilitation could be carried on. For example, the conditions known as cleft palate and cleft lip would lend themselves well to this approach. At present, there is a pitiable insufficiency of research on and specialized treatment available for these conditions which occur at the rate of 1 in every 800 live births. There are now approximately 250,000 persons so afflicted in America, with 5,000 new ones being added each year.

The causes of cleft palate and cleft lip are only empirically understood. We know that the cleft persists because the tissues did not close at certain stages of embryonic development. Animal studies have enabled workers to produce clefts in poultry, mice and dogs, and there is evidence of a nutritional factor in its causation, at least in certain animals. With these living examples available for study, experiments are going forward to seek out the underlying causes of the defects and to develop preventive remedies, if possible. This humane work must be expanded and, coextensively, work must go forward and facilities expanded to help those who now have the affliction.

The dental profession, in cooperation with medical and other health professions, has been working on the problem for several decades. There is continuing progress in the development of better surgical technics, prosthetic devices to obturate the palatal defect and more effective means and methods to improve speech and personality.

The Lancaster Cleft Palate Clinic in Pennsylvania is an outstanding example of a treatment center in which teamwork among the professions and the utilization of pooled knowledge are being combined for the best results available today. But it is recognized generally that this and a few other institutions are not enough. Treatment is delayed for many unfortunate youngsters who simply cannot be fitted into the schedules, and comprehensive treatment is denied to many for whom arrangements can be made only to correct immediate surgical needs or to construct a vitally necessary appliance.

Through the use of x-ray motion pictures, a few investigators have been able to gain new knowledge of the movements of the organs of speech and mastication. These investigations with cineradiography already are being applied to the improvement of surgical and prosthetic technics, both in cleft palate patients and in patients who require correction of other crippling oral defects. But there are too few places where this research is being done, and we are moving slowly in an area where we should be progressing rapidly. Fully equipped and staffed cleft palate centers should be established in several parts of the country. In addition to providing more acutely needed services and opportunities for research, such additional centers would be the nuclei for training more resource personnel from dentistry, medicine, psychology and social science.

The members of this committee would enjoy a highly rewarding experience if they visited the institution in Lancaster, Pa., devoted to cleft palate therapy, and observed at first hand the remarkably successful results that are being achieved with children born with even the most severe oral, facial and speech defects. In more and more instances, these children are being rehabilitated physically and psychologically so that they are able to live comfortably and function normally in society.

It might be brought to the attention of the chairman that the Joseph Samuels Dental Clinic in Providence, R. I., would be a natural location for a regional clinical training and research center specializing in oral, facial and speech defects in children. Such work would go hand in hand with the work that is being done in that institution on the dental needs of handicapped and retarded children.

There also should be participation by dental scientists in the cooperative utilization of the clinical centers which we understand are being established by the National Institutes of Health

in various parts of the country for metabolic and other special studies. Such centers would provide outstanding opportunities for investigating dental problems and pathologic changes in health and disease under ideal conditions of study. As indicated previously in relation to congenital oral and facial defects, some of dentistry's greatest contributions to health may be expected to arise from cooperative teamwork of dentists, physicians and basic scientists in centers like these.

There is special need for the cooperative approach in research relating to periodontal diseases which affect and are affected by various systemic conditions that are under the treatment and control of physicians. These conditions include diabetes, pregnancy, menopause, cardiovascular disease, blood dyscrasias, and so on. Dentally oriented studies conducted simultaneously with medically oriented studies of diabetic patients at the regional metabolic disease centers would be of great value and would conserve facilities and reduce duplication. Studies of bacteremia obviously could be performed with great benefit and efficiency under similar circumstances. Many other vital research projects lend themselves advantageously to the multi-disciplinary approach.

TRAINING GRANT PROGRAM

The need for additional teachers and research workers continues to be serious in all of the country's dental schools. If several new schools are established within the next few years as expected, the shortage will become even more critical.

This problem deserves urgent attention at this time if the quality of dental education is to remain at an acceptable level.

It is estimated that the 47 schools could easily absorb at least 150 full-time teachers each year, and that the presently existing backlog of budgeted vacancies on dental faculties is over 250. The five new dental schools that may come into existence in the next five years each will require in the neighborhood of 100 teachers. Two of these schools, one at University of California at Los Angeles and one at the University of Kentucky, will be in operation in the near future; both are now recruiting faculty members. Obviously, the needs in this area are crucial and the efforts to improve the situation should be stepped up.

The training grant program which was inaugurated in 1956 to produce additional teaching and research personnel only now is beginning to produce results. Certainly, it should be continued and expanded.

Nearly half of the dental schools have training programs in operation and the funds allowed for this operation for fiscal 1960 already have been exhausted. Many applicant schools received far less than was needed and they are prepared to use additional funds immediately. Moreover, several additional schools are ready to make their training programs operative if sufficient funds can be made available.

The Association believes strongly that expansion of this program is essential.

The Association also believes that the training grant program should be extended into another area that would increase substantially the availability of dental care to the general population.

Studies conducted by the Association and other agencies have demonstrated that the productivity of dentists can be increased by the employment and effective use of auxiliary dental personnel. The extensive U.S.P.H.S. studies on dental care services for school children which were conducted in Richmond, Ind., and Woonsocket, R. I., demonstrated that a close, efficient relationship between the dentist and auxiliary personnel can expand the output of high quality dental care. In these two programs it was found that "significantly more dental care services per dentist were achieved, thus extending a health service to a greater proportion of a child population."[1]

A survey[2] conducted by the Association showed that dentists with one auxiliary employee averaged 47.4 per cent more patients than dentists with no employees.

Another reliable study[3] has shown that dentists may increase their weekly patient load as much as 68.8 per cent through the expert use of auxiliaries.

Recently, pilot studies completed in six dental schools have indicated that dental students trained in the effective use of dental assistants could produce significantly higher quality and greater quantity of services than those not given such training. In one of the schools, the students achieved an average increase in productivity of 37 per cent. In the six schools, the increases ranged from 25 to 40 per cent.

It has not been possible to increase the number of graduates through the expansion of dental school enrollments and through establishment of a few new dental schools to the extent necessary to keep up with the increasing need for dental service. Nor does it appear likely that this can be done in the reasonably near future. It is possible, however, with proper training to increase appreciably the amount of dental service which each dental graduate of the future can provide. This can be accomplished by training dental students in the effective utilization of dental auxiliary personnel. Such training cannot take the form of didactic methods of instruction; it must emphasize

experience with patients in which chairside assistants participate with the students in as many operations as possible.

The experiences of the six schools that have experimented with this type of program provide evidence that it is both practical and desirable.

The request for funds to enable all of the dental schools to embark on a sound and complete program of training dental students to use chairside assistants is a most important one. Students must be given this experience while in dental school, not only so that they will understand how to use these personnel effectively, but also to assure that, after becoming accustomed to using chairside assistants, they will insist upon using them when they enter dental practice. Establishing training programs of this type in dental schools means employing well educated and experienced dental assistants, adding teaching personnel, readjusting many of the courses in the dental curriculum, modifying the physical structure of the clinics to accommodate the chairside assistant and acquainting the entire dental faculty with the expanded objectives of the program.

All dental schools should be given the opportunity immediately to establish training programs of this kind. The Association believes that by this means further lengthening of the gap between dental needs and available dental care might be forestalled.

RESEARCH FELLOWSHIPS

The continual training of resource personnel is vital to the dental research program, and the committee has been informed of what is being done and is contemplated within the training programs at existing dental schools and related institutions. For the advanced research worker, and for the promising graduate and undergraduate, however, the kind of training provided in the research fellowship program of the NIH also is essential. The postdoctoral fellowships, senior fellowships and special research fellowships permit the candidate to obtain advanced training in departments and institutions which offer special teaching opportunities and facilities that are not always accessible through the training program at a single dental school. These fellowships permit the individual to go to a laboratory where he may obtain specialized training and experience which may not be available anywhere else. A substantial number of dental scientists and potential research investigators are now ready for special training, and funds are necessary to meet their needs in order to utilize their talents fully. The number of persons entering the fellowship program has increased significantly over the past few years, and it is growing continually.

Of special importance is the productive expansion which is developing in the use of student part-time research fellowships. Last year, 376 undergraduate students entered this program. Exposure of these young men to research disciplines in their undergraduate years is productive not only in terms of the specific contributions they make to our knowledge of dental phenomena but even more so in terms of stimulating their interest in becoming career research investigators after graduation. Many of the men who worked under a part-time fellowship wish to continue in scientific research after they obtain the doctoral degree, and additional funds must be provided to give them the training they need through the postgraduate fellowships just discussed. The undergraduate fellowships, the postdoctoral, senior and special fellowships and the training program grants are inseparably linked to each other in the over-all developmental program which dentistry has now established.

The Association believes strongly that this program should be expanded during the next year.

SUMMARY AND RECOMMENDATIONS

The American Dental Association believes strongly that this country's dental research program should continue to progress. The burgeoning population, together with the existing and predictable dental manpower shortage, make expansion in several critical areas imperative.

The excellent progress made during the last year in both federal and nonfederal institutions has been brought to the attention of the committee by the administrators of the National Institute of Dental Research programs. Highlights of some of this work have been referred to today. Obviously, however, time does not permit more than a glimpse of the encouraging results that are being produced at many institutions throughout the country. The forward-looking and commendable support given to dental research and education by the members of this committee has been a large factor in the achievements that have been obtained heretofore and in setting the stage for even more promising gains in the future.

For fiscal 1961, the Association believes that some facets of the dental research and training programs require more expansion and acceleration than are contemplated in the budget that has been submitted by the President. For the

reasons that have been outlined, it is the Association's considered judgment that unless this is done, the dental disease problem will continue to outrun our ability to cope with it by an increasingly lengthening margin.

Accordingly, the Association recommends that the committee give special attention to the increasing acute need for dental research and teaching personnel and for the need to increase the availability of dental care by training dental students in the efficient use of dental auxiliary personnel. For these purposes, it is recommended that the President's budget item for training grants be increased by three million dollars. This would permit a reasonable expansion in the existing program and would allow the dental schools to inaugurate the much needed programs related to the efficient and effective use of dental assistants.

The Association also recommends an increase in funds for the project grant program to permit reasonable progression in the research projects to be undertaken and continued in dental schools and other dental institutions and also the introduction of some dentally oriented basic research projects at nondental centers of learning. For these purposes, an increase over the President's budget of $1,225,000 is recommended.

Finally, the Association recommends that the fellowship grant program be permitted to go forward to encourage a continuing source of qualified individuals who have demonstrated interest and ability in research and teaching. For this purpose, the Association recommends an increase over the President's budget of one million dollars.

The American Dental Association believes that the appropriation of the $5,225,000 increase over the President's budget as recommended for the activities indicated will provide a well-rounded, reasonably progressive dental research and public health program for fiscal 1961.

1. Waterman, G. E. The Richmond-Woonsocket studies on dental care services for school children. J.A.D.A. 52:676 June 1956.

2. American Dental Association, Bureau of Economic Research and Statistics. 1956 survey of dental practice. VII. Number of patients and patient visits. J.A.D.A. 54:691 May 1957.

3. American Dental Association, Bureau of Economic Research and Statistics. 1950 survey of dental profession. III. The dentist's work week. J.A.D.A. 41:505 Oct. 1950.

Opportunities for study, teaching and research abroad

COUNCIL ON INTERNATIONAL RELATIONS

More than 10,000 students and teachers travel abroad each year to study, teach or conduct research projects. Of this number, approximately 6,000 receive grants through the International Educational Exchange Program of the U. S. Department of State. Other individuals receive grants from U. S. foundations, governments and schools abroad, or travel at personal expense.

A variety of grants is offered by the Department of State under the Fulbright or Smith-Mundt Acts or under one of the two inter-American cultural conventions. Such grants enable Americans to visit another country in order to: (1) study at the graduate level for a year at a university or other institution of higher learning; (2) lecture for a year or at least a semester in a college or university; (3) conduct advanced research for a year or at least a semester at a college, university or other institution of higher learning; (4) serve as a consultant in a special field for a period of from three to six months.

QUALIFICATIONS OF GRANTEES

Individuals applying for grants must have certain personal qualifications such as emotional maturity, interest in other cultures and ability to adapt to different—and sometimes difficult—living conditions. Additionally, they must demonstrate professional or scholastic competence and must propose a plan of activity in line with their qualifications. Usually, knowledge of the language of the country to which they will go is required.

GRADUATE STUDY

A grant for graduate study usually runs for one year and is renewable only in exceptional cases. Fulbright grants include transportation, tuition, maintenance and incidental expenses. Smith-Mundt grants, which are designed primarily to supplement other grants, may cover only part of these expenses. No extra funds are provided for travel of dependents.

Applications for Fulbright grants should be made to the Fulbright program adviser on campus. If the individual is not now enrolled in an American university, he should apply to the Institute of International Education, 1 E. Sixty-seventh St., New York 21. Annual competition for these awards opens in May and is generally completed by October 31 with the awards becoming effective for the following year.

Applications for Smith-Mundt grants should be made directly to the Institute of International Education.

TEACHING ABROAD

Grants for teaching abroad usually are made for one year, but a few are made for a single semester or a summer session. Grants usually include transportation and necessary expenses. No provision is made for transportation of dependents; however, cost-of-living allowance may be provided for dependents while in the foreign country.

A candidate usually must have a Ph.D. degree or equivalent professional status (D.D.S. usually accepted) and he must have at least a year of college teaching experience. Normally he will lecture in English. However, in Austria, France, Germany, Belgium, Italy and Latin America, ability to lecture in the language of the country is usually required.

Applications for lectureship grants should be made to the Conference Board of Associated Research Councils, 2101 Constitution Ave., N.W., Washington 25, D. C. Individuals interested in lecturing in Europe, the Near East, Japan or China should apply between June 1 and October 1 for the academic year beginning in the fall of the next year. Individuals interested in other East Asian countries or the Pacific area, or in Latin America should apply between March 1 and April 15 for the academic year beginning in the spring or summer of the next calendar year.

Individuals interested in lecturing for shorter terms may wish to write to the Board, which maintains a general register of American professors who are interested in lecturing abroad.

ADVANCED RESEARCH

Grants for research abroad are usually for one year but shorter projects are considered. Grants cover travel and living expenses. No transportation is provided for dependents, although cost-of-living allowance may be provided for them while in the foreign country.

A prospective candidate must have a Ph.D. degree or an equivalent professional status. He should know the language of the country to which he is going and he must submit an acceptable research project.

Applications should be sent to the Conference Board of Associated Research Councils, 2101 Constitution Ave., N.W.,

Washington 25, D. C. Application dates are the same as those listed earlier for teaching grants.

SPECIALISTS AND PUBLIC LECTURERS

U. S. specialists and public lecturers are recruited for grants only when a foreign organization or institution asks for such special services. There is no formal application procedure; however, individuals interested in obtaining more information about opportunities under the program should write to the American Specialists Branch, International Educational Exchange Service, Department of State, Washington 25, D. C.

ADDITIONAL FELLOWSHIP PROGRAMS

In addition to the Fulbright and Smith-Mundt programs, a number of other fellowship programs for work abroad are conducted by governmental and private agencies. A partial listing of these follows:

World Health Organization Fellowships. The World Health Organization each year has a limited number of short-term fellowships for the "improvement and expansion of health services." Applicants must be engaged in full-time public health or educational work. Fellowships cover per diem and transportation and usually are limited to from two to six months. Employers will be expected to approve the application and to continue salary during the fellowship. Further information is available from Dr. Howard M. Kline, secretary, WHO Fellowship Selection Committee, Public Health Service, Washington 25, D. C.

National Academy of Sciences—National Research Council, 2101 Constitution Ave., Washington 25, D. C. A variety of research fellowships, including predoctoral and postdoctoral fellowships of the National Science Foundation. Basic stipend usually $3,800 with additional allowances for dependents and foreign travel. Holders of dental degree specifically eligible provided an acceptable plan of study and research is presented.

Rotary International, 1600 Ridge Ave., Evanston, Ill. Approximately 130 Rotary Foundation fellowships for advanced study for one academic year in any subject in any country with Rotary Clubs; grants cover school, living and transportation costs; applicants should be 20-28 years of age and must be sponsored by local Rotary Club. Applications should be sent to local club.

Eisenhower Exchange Fellowships, Inc., 256 S. Sixteenth St., Philadelphia 6. Limited number of fellowships providing expenses of maintenance and travel, tenable in any country and open to candidates age 25-40 who have already achieved success in their field and who are potential leaders in their profession.

Damon Runyon Memorial Fund for Cancer Research, Inc., 399½ Madison Ave., New York 17. Fellowships of $3,600 to $6,000 a year for one to three years of study; open to candidates under 40 having Sc.D. or Ph.D. degree.

National Institutes of Health, Public Health Service, Department of Health, Education and Welfare, Bethesda 14, Md. Postdoctoral fellowships, special research fellowships and clinical traineeships for one year, renewable for two additional years; stipend of $3,800 or higher a year plus dependency and travel allowances. Apply to Research Fellowships Branch, Division of Research Grants at address listed.

Grants are also provided by many other foundations and governmental agencies on a one-term basis. Additionally, many foreign governments provide grants for study in their country. Such fellowships in many instances are administered by the Institute of International Education, 1 E. Sixty-seventh St., New York 21. Inquiries to the Institute should be specific as to the type of program, country, qualifications of the individual, etc.

FOUNDATIONS AND SOCIETIES

A variety of foundations exist which are primarily concerned with one country or one area of the world. These foundations often offer fellowships and invariably offer such services as introductions and information for Americans going abroad.

American Friends of the Middle East, 47 E. Sixty-seventh St., New York 21. Assists American students going to the Middle East in making contacts there.

American Institute of France, Inc., 19 E.

Sixty-fourth St., New York. Counsels American students planning to study in French universities.

America-Israel Society, Willard Hotel, Washington 4, D. C. Arranges hospitality tours for Americans visiting Israel.

America-Italy Society, 22 E. Sixtieth St., New York 22. Provides introductions for Americans going to Italy.

American-Scandinavian Foundation, 127 E. Seventy-third St., New York. Provides introductions for members and those appointed as honorary fellows to Denmark, Iceland, Norway or Sweden. Provides some fellowships.

American Society of Friendship with Switzerland, 8 W. Fortieth St., New York 13. Provides information and advice for American students going to Switzerland. Provides some fellowships.

Belgian American Educational Foundation, 420 Lexington Ave., New York 17. Provides practical help and counsel to academic and scientific personnel going to Belgium. Provides some fellowships.

China Institute in America, Inc., 125 E. Sixty-fifth St., New York 21. Provides introductions for American educational and other leaders visiting Formosa.

English-Speaking Union, 19 E. Fifty-fourth St., New York 22. Provides information services for persons visiting the United Kingdom.

Institute of African-American Relations, 732 Twenty-third St., Washington 7, D. C. Assists American educators and research workers planning to teach or study in Africa.

Japan Society, Inc., 13 E. Fiftieth St., New York 22. Assists and advises Americans desiring to visit Japan for study or teaching.

Netherland-America Foundation, 551 Fifth Ave., New York 36. Provides counsel and introductions for Americans going to The Netherlands.

Pan American Union, Washington 6, D. C. Division of Education provides information and counseling to persons visiting Latin America; provides letters of introduction to educators.

International Science Center, California Academy of Sciences, Golden Gate Park, San Francisco 18. Sponsored by the International Science Foundation of which the American Dental Association is a member. Assists Americans going abroad to make contacts with academies of science and research councils in other countries.

DENTAL SCHOOLS AND SOCIETIES ABROAD

Individuals interested in obtaining a list of dental schools of the world, or a list of national dental societies may obtain them from the Association's Council on International Relations.

Employment opportunities abroad for U. S. dentists

COUNCIL ON INTERNATIONAL RELATIONS

Stated very simply, dentists from the United States who wish to work abroad will find few opportunities and many obstacles. There are a few positions available, both in governmental and private programs; however, the dentist will need considerable persistence to find them. There is no central listing available. In addition, criteria for the positions are quite specific and demanding.

EMPLOYMENT WITH AMERICAN FIRMS

The trend in overseas operations of U. S. concerns is toward employment of foreign nationals in all categories of positions, including those at the technical, managerial and professional levels. In general, the longer a company operates in any country, the greater is its reliance on local personnel. American personnel are needed chiefly on a short-term basis to establish operation of a program.

According to the survey, *American Business and Overseas Employment*, published by Syracuse University in June 1957, approximately 650 companies doing business overseas reported 24,600 United States citizens and 1,280,000 nationals at work for their firms in overseas establishments, a ratio of one U. S. citizen to 52 local employees. Oil companies employed the largest number of U. S. citizens with a ratio of one to 22.

The firms report three main reasons for employing local personnel: (1) lower cost of supporting local personnel compared with maintenance of U. S. citizens abroad; (2) maladjustment of many Americans working amid alien cultures, and (3) improvement in company relations with the community and the government gained through use of local personnel.

Employment of American citizens is also restricted by labor laws which place a ceiling on the ratio of American to local personnel, and, in the case of dentists, on licensure laws which may include the requirement for education in the country of employment.

A number of employment agencies in large cities specialize in obtaining personnel for overseas firms. However, dentists are warned to investigate such agencies carefully before signing contracts or paying fees; in some cases the applicant pays a fee and in turn receives only a list of firms abroad, lists which are often available in public libraries.

SOURCES OF INFORMATION

Local offices of state employment agencies frequently maintain lists of opportunities abroad, even in professional categories. Public libraries usually have available numerous trade directories and manuals containing names and addresses of American business organizations operating abroad.

The U. S. Department of Commerce

publishes a variety of materials primarily designed to give marketing assistance and secondarily providing information on employment opportunities.

Some of the publications are:

World Trade Information Service Reports. Included in this series are reports on living conditions in specific countries. Request should be made for information on a specific country. Pamphlets at 10 cents each may be obtained from the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C.

Trade Lists of American Firms, Affiliates and Subsidiaries. These are maintained for 40 individual foreign countries at $2 a list for each country. It is emphasized that firms listed may not be seeking help. Copies may be obtained from the U. S. Department of Commerce, Washington 25, D. C.

Publications which may be obtained in many public libraries are:

How to Get a Job That Takes You Traveling. By Norman D. Ford, Harian Publications, Greenlawn, N. Y. 72 pages, $1.50. Contains information on work with the Red Cross, missionary, teaching, World Health Organization and other United Nation agencies; on business and government employment overseas, and on work opportunities in individual foreign lands. Lists some of the U. S. construction, mining and petroleum companies with overseas interests.

Foreign Operations, 1958. A Guide to New Developments and Opportunities in U. S. Business and Government Foreign Operations. Foreign Operations, Inc., 2187 Yale Station, New Haven, Conn. $1.75. Includes separate sections on career opportunities and on the larger areas of foreign operations.

Partial List of U. S. Firms Operating in Latin America. Pan American Union, 17th and Constitution Ave., N.W., Washington 6, D. C. No charge. Gives names and addresses of firms operating in Latin America.

International Petroleum Register. Annual. Editorial Office 604 Fifth Avenue. New York 20. $15. Lists active petroleum companies of the world, giving history, capital structure, personnel location and size of operation.

GOVERNMENT EMPLOYMENT OVERSEAS

Governmental agencies on occasion may seek the services of U. S. dentists, particularly those with educational or public health training, for service overseas. The difficulty is that each agency usually conducts its own recruitment program and no central clearing house of employment opportunities exists. One publication which does give a broad variety of information is the following:

Federal Jobs Overseas. Pamphlet 29, U. S. Civil Service Commission. For sale at 10 cents per copy from the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C. Provides information on employment abroad by the federal government both in civil service and non-civil service positions. Lists conditions of employment and the principal agencies employing overseas personnel. Also indicates the types of positions for which specific agencies may be recruiting, and the addresses to which inquiries should be sent.

PRACTICE ABROAD

At present, there is no single source of information on educational and licensure requirements of foreign nations. Individuals seeking information on a specific nation may wish to write to the national dental society. Information may also be obtained by writing to graduates of U. S. dental schools who are now practicing abroad. A list of national dental societies of the world and a list of U. S. graduates practicing abroad may be obtained from the Council on International Relations, American Dental Association.

Plan annual award 'for excellence in dental journalism'

COUNCIL ON JOURNALISM

The Council on Journalism met March 13 and 15 in Chicago and took several steps designed to aid and strengthen dental society publications. The Council voted:

1. To include all component dental society journals with circulations above 1,000 copies per issue in all programs for constituent dental society journals.

2. To discuss with officers of the American Association of Dental Editors a proposal to employ a national advertising representative for constituent dental society journals.

3. To ask the editors of all constituent and component dental society journals to carry on the mastheads of their journals a statement of membership in the American Association of Dental Editors, if eligible to do so.

4. To approve a revised editor's kit and to announce the availability of the kits for constituent and component dental societies, at the annual session of the American Dental Association, October 17-20 in Los Angeles. The project for an editor's kit had been initiated by the Council's former chairman, J. C. Almy Harding.

5. To applaud a proposal of the American Association of Dental Editors that it employ a part-time secretary and raise dues sufficiently to employ such a secretary.

6. To approve a proposal of the Council on Dental Trade and Laboratory Relations that constituent and component dental journals publish newsworthy items concerning dental laboratory activities, to establish more cordial relations between the dental society and the laboratory association in the area. A letter to implement this program is being sent all editors.

7. To issue a Mimeographed supplement to the 1957 edition of *Rates & Data —State Dental Journals,* pending publication of a new edition of that publication.

8. To ask the Board of Trustees and House of Delegates of the American Dental Association to endorse the principle that dental societies have complete control over the contents—both editorial and advertising—of their official publications.

9. To award an annual certificate of merit "for excellence in journalism" to the most outstanding dental society publication.

The Council will present its first award at the 1961 Conference on Dental Journalism, to be held March 13-14, in the Central Office. Journals will be judged on the basis of editorial content, news reporting, design and format, and handling of advertising. Members of the Council will serve as judges.

On March 14-15 in the Central Office the Ninth Conference on Dental Journalism was held under the joint sponsorship of the Council and the American Association of Dental Editors. One hundred and five dental editors representing most of the constituent and component dental journals being published in the United States were in attendance. More than 100 conferees attended the March 14 luncheon at which Morris Fishbein, M.D., former editor of the *Journal of the American Medical Association*, spoke on "The Importance of a Professional Journal." Speakers at the two-day conference included dental and medical editors, representatives of the United States Post Office, and experts on magazine production and layout, engraving, and advertising.

Additions to the Library

BUREAU OF LIBRARY AND INDEXING SERVICE

The books listed here have been added recently to the Library collection. Requests for this material, available on loan to all members of the Association, should be addressed to the Bureau of Library and Indexing Service. There is no charge for borrowing books, but there is a minimal charge of one dollar for each package library. Practically all the dental journals published in the world at present are available also to members on loan. Lists of books and package libraries are also available on request.

BOOKS

American College of Dentists. Register for membership as of December 1, 1959. St. Louis, 1959. 84 p.

American Dental Association. Specifications for dental materials, 1960-1961. Prepared by G. C. Paffenbarger, J. W. Stanford and W. T. Sweeney for the Council on Dental Research, American Dental Association. 4th ed. Chicago, 1960. 88 p. $2.25.

American Dental Association. Council on Dental Therapeutics. Accepted dental remedies: drugs used in dental practice including a list of brands accepted by the Council on Dental Therapeutics of the American Dental Association. 25th ed. Chicago, 1960. 212 p. $3.

Arbelaez, Elisa & Others. Importancia de la conductometría en endoncia. (Seminario para optar el título de doctores en odontología—Pontificia Universidad Católica Javeriana.) Bogotá, 1959. 74 p.

Audio-Visual Equipment Directory. 6th ed. Fairfax, Va., National Audio-Visual Association, 1960. 265 p. $4.25.

Bermudez, Soledad & Corrales, Evelyn. Técnica modificada del arco de Canto. (Thesis-Pontificia Universidad Católica Javeriana.) Bogotá, 1959. 52 p.

Blau, Fred. La méthode fonctionnelle en orthopédie dento-faciale. Paris, Prélat, 1959. 269 p.

Brooks, C. M. & Cranefield, P. F., ed. The historical development of physiological thought; a symposium held at the State University of New York Downstate Medical Center, New York, Hafner, 1959. 401 p.

College of Medical Evangelists. Alumni Association. Is your halo on straight? Los Angeles, San Lukas Press, 1955. 46 p. $1.

Collins, L. H. & Crane, M. P. Internal medicine in dental practice. 5th ed. Philadelphia, Lea & Febiger, 1960. 555 p. $8.50.

CONDRY, A. H. The story of the Incorporated Dental Society. London, British Dental Association, 1959. 26 p. Mimeo. $0.84.

COURVILLE, C. B. Cerebral palsy; a brief introduction to its history, etiology, and pathology, with some notes on the resultant clinical syndromes and their treatment. Los Angeles, San Lukas Press, 1954. 80 p. $2.50.

COX, S. D. Public Dental Service Association, 1923-1949; historical note. London, British Dental Association, 1959. 25 p. Mimeo. $0.84.

CROSS, L. M. The preparation of medical literature. Philadelphia, Lippincott, 1959. 451 p. $10.

DARCISSAC, MARCEL. Mes méthodes—mes techniques en odonto-stomatologie. Tome I: thérapeutique bucco-dentaire et maxillo-faciale. Paris, Maloine, 1959. 254 p.

DIDLAUKIES, HELGA. Untersuchungen über den pH-Wert in Wurzelkanälen bei Ersteröffnung von Zähnen mit entzündlichen oder necrotischen Pulpas. (Thesis—Universität Halle.) Halle, Saale, 1959. 30 p. On microfilm only.

DOUGLAS, W. A. A history of dentistry in Colorado, 1859-1959. Denver, Colorado State Dental Association, 1959. 277 p. $5.

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Supplement to List of Certified Dental Materials

COUNCIL ON DENTAL RESEARCH

Deletion • The American Dental Association Research Division, National Bureau of Standards, has been advised by the manufacturer of the material listed below that this product is to be withdrawn from the market and, therefore, it should be eliminated from the List of Certified Dental Materials.

CERTIFIED HYDROCOLLOIDAL IMPRESSION MATERIALS—AGAR TYPE (A.D.A. SPECIFICATION NO. 11)

Material	*Manufacturer or distributor*
Crown Hydrocolloid	General Refineries, Inc.

Council adopts F.D.I. Specification for Alloy for Dental Amalgam

COUNCIL ON DENTAL RESEARCH

The Council on Dental Research adopted the Specification for Alloy for Dental Amalgam of the Fédération Dentaire Internationale as the official specification for the American Dental Association in May 1959, effective July 1, 1960.

The Council action was taken after consideration of the recommendation of the Specifications Committee of the Dental Materials Group (International Association for Dental Research). This is one of the three committees through which the Council maintains liaison with dental trade groups and with departments of dental materials in the schools.

It is desirable to have specifications for dental materials as widely accepted as possible, especially internationally. Much of the wording of the F.D.I. specification is similar to the provisional draft of the Association's specification prepared by the Specifications Committee some time ago. The F.D.I. specification will serve as an ad interim revision of the Association's specification. Revision of the Association's specification will continue with no change in policy or intent.

The American Dental Association Specification No. 1 for Alloy for Dental Amalgam is the same as the Fédération Dentaire Internationale Specification for Alloy for Dental Amalgam except for Section 2.1 Specifications, designating where copies of the specifications may be obtained, and for Section 4.1 Sampling. In the latter section, the amount and method of procuring the test samples are stated.

The Fédération Dentaire Internationale Specification for Alloy for Dental Amalgam was published in the *International Dental Journal* 9:421 September 1959, and discussed in the 1960-61 edition of *American Dental Association Specifications for Dental Materials.*

Individual copies of American Dental Association specifications may be obtained free upon application to the Council on Dental Research, American Dental Association, 222 E. Superior St., Chicago, or to the American Dental Association Research Division, National Bureau of Standards, Washington 25, D. C.

Council announces classification of additional products

COUNCIL ON DENTAL THERAPEUTICS

The classification of products by the Council on Dental Therapeutics has been described in a previous report (J.A.D.A. 40:489 April 1950). The Council's program provides for classification of products in Group A, Group B, Group C and Group D. Products are reconsidered periodically and decisions are subject to change at any time that a substantial amount of new evidence becomes available. The files of the Council contain information on many drugs and dental cosmetics, and inquiries are welcome.

GROUP A

Listing of products in Group A means that at the time of their consideration, the items conformed with the provisions for acceptance established by the Council on Dental Therapeutics and adopted by the Board of Trustees and the House of Delegates of the American Dental Association. Items in this group will be listed in *Accepted Dental Remedies*, and may use the Seal of Acceptance, unless otherwise provided.

The following additional products are classified in Group A:

Acetylsalicylic Acid, U.S.P. (See A.D.R. 1960, p. 47)

Bayer Aspirin Tablets, 5 grains (Glenbrook Laboratories): Each tablet is stated to contain acetylsalicylic acid, 5 grains, with excipient.

Bayer Asprin (Flavored) for Children, 1¼ grains Tablets (Glenbrook Laboratories): Each tablet is stated to contain acetylsalicylic acid, 1¼ grains, flavoring and color.

Potassium-Sodium Carbonates Mixture (See A.D.R. 1960, p. 143)

Desensitizing Paste (Mixture of Sodium and Potassium Carbonates, U.S.P.) (Stratford-Cookson Company): Each 100 Gm. is stated to contain sodium carbonate anhydrous, 20 Gm.; potassium carbonate, 80 Gm., with glycerin sufficient to make a paste.

Bacitracin, U.S.P. (See A.D.R. 1960, p. 72), **Neomycin Sulfate, U.S.P.** (See A.D.R. 1960, p. 73), **Polymyxin B Sulfate, U.S.P.** (See A.D.R. 1960, p. 73)

The following product has been reclassified from Group B (see report, J.A.D.A. 54:854 June 1957) to Group A by the Council on Dental Therapeutics:

Wybiotic Troches (Wyeth Laboratories): Each 3.7 Gm. troche is stated to contain zinc bacitracin, 300 units; neomycin sulfate, 5 mg. (base); polymyxin B sulfate, 2,000 units; citric acid, 50 mg.;

cyclamate sodium, 8.333 mg.; color and flavor, in a candy base.

Thiopental Sodium for Injection, U.S.P. (See A.D.R. 1960, p. 44)

Pentothal Sodium (Abbott Laboratories): (See A.D.R. 1960, p. 44)

Pentothal Sodium Sterile Powder: Marketed in 6.25 Gm., 10 Gm. and 12.5 Gm. multiple-dose Ampoules; 5 Gm. in 250 ml. size multiple-dose containers, and 10 Gm. in 500 ml. size multiple-dose containers.

Pentothal Sodium Rectal Suspension: Each Gm. is stated to contain thiopental sodium, 400 mg., and anhydrous sodium carbonate, 24 mg., in a water miscible mineral oil suspension. Marketed in Abbo-Sert Disposable Syringe, 2 Gm. size.

Barbiturates (See A.D.R. 1960, p. 55)

AMOBARBITAL, U.S.P.
(Brand name: Amytal)
5-Ethyl-5-isoamylbarbituric acid. $C_{11}H_{18}N_2O_3$. M.W. 226.28.

Amobarbital occurs as a white, odorless, crystalline powder, having a bitter taste. It is very slightly soluble in water (1:1,300), freely soluble in alcohol (1:5), soluble in chloroform (1:17), and freely soluble in ether (1:6).

Actions and uses: The actions and uses of amobarbital are essentially similar to those of barbital except that amobarbital is effective in smaller doses. The duration of action is intermediate between the prolonged action of barbital and the short action of pentobarbital. Amobarbital is used orally as a preoperative or postoperative sedative and it may be employed in combination with analgesics.

Dosage: Adult, orally, as a sedative, 50 to 100 mg. (¾ to 1½ grains). It is suggested that a single prescription for barbiturates be limited to six consecutive doses.

AMOBARBITAL TABLETS, U.S.P.
AMOBARBITAL ELIXIR, N.F.

Each 4 ml. contains amobarbital 17.6 mg.; alcohol, 27 to 33 per cent by volume.

Amytal (Eli Lilly and Company): A brand of amobarbital, U.S.P.

Elixir Amytal, 2 grs. per ounce: A brand of amobarbital elixir, N.F.

Elixir Amytal, 4 grs. per ounce: Each 30 ml. (fluid ounce) is stated to contain amobarbital, 250 mg. (4 grains), in a 34 per cent alcohol solution with saccharin sodium, propylene glycol, methenamine, color, flavor and purified water.

Tablets Amytal 16 mg. (¼ gr.), 32 mg. (½ gr.), 50 mg. (¾ gr.), 0.1 Gm. (1½ grs.): A brand of amobarbital tablets, U.S.P.

Pulvules Amytal and Acetylsalicylic Acid: Each pulvule is stated to contain amobarbital, 50 mg. (¾ gr.); acetylsalicylic acid, 0.325 Gm. (5 grs.), with excipients.

AMOBARBITAL SODIUM, U.S.P.
(Brand name: Amytal Sodium)
Sodium 5-ethyl-5-isoamylbarbiturate.
$C_{11}H_{17}N_2NaO_3$. M.W. 248.26.

Amobarbital sodium occurs as a white, odorless, hydroscopic, friable, granular powder, having a bitter taste. It is very soluble in water, soluble in alcohol, but practically insoluble in ether and in chloroform.

Actions, uses and dosage: These are the same as those of amobarbital.

AMOBARBITAL SODIUM CAPSULES, U.S.P.
AMOBARBITAL SODIUM, STERILE, U.S.P.

Amytal Sodium (Eli Lilly and Company): A brand of amobarbital sodium, U.S.P.

Pulvules Amytal Sodium, 65 mg. (1 gr.), 0.2 Gm. (3 grs.): A brand of amobarbital sodium capsules, U.S.P.

Suppositories Amytal Sodium 0.2 Gm. (3 grains): Each suppository is stated to contain amobarbital sodium, 0.2 Gm. (3 grains) in an oil and wax base.

Denture Adherent Preparations (See A.D.R. 1960, p. 165)

Benefit Denture Adhesive (Polymed Laboratories, Inc.): Each 100 Gm. is stated to contain methyl cellulose, 30 Gm.; hydroxyethyl cellulose, 70 Gm.

Eli Lilly and Company

Eli Lilly and Company's brand of the following official preparations, currently

described in *Accepted Dental Remedies*, 1960, have been classified in Group A:

Belladonna Tincture, U.S.P.

Strong Iodine Tincture, N.F.

Nicotinic Acid Tablets, U.S.P., 50 mg., 100 mg.

Nicotinamide Tablets, U.S.P., 50 mg., 100 mg.

Caffeine and Sodium Benzoate Injection, U.S.P., 0.5 Gm. per 2 ml.

Saccharin Sodium Tablets, U.S.P., ¼ grain, ½ grain, 1 grain.

Atropine Sulfate Tablets, U.S.P., 1/100 grain, 1/150 grain, 1/200 grain

Benzoin Tincture, U.S.P.

Aromatic Ammonia Spirit, U.S.P.

The following additional products, marketed by Eli Lilly and Company, have been classified in Group A:

Atropine Sulfate, U.S.P. (See A.D.R. 1960, p. 138)

Ampoule Atropine Sulfate 1/150 gr. (0.4 mg.) per cc.: Each 100 ml. is stated to contain atropine sulfate, 43.2 mg.; chlorobutanol, 0.5 Gm., and water for injection.

Treatment of Emergencies (See A.D.R. 1960, p. 9)

Aspirols Aromatic Ammonia 0.4 cc.: Each 100 ml. is stated to contain ammonium hydroxide, 55.71 Gm.; alcohol, 37.36 cc.; aromatic substances and color.

GROUP B

Listing of products in Group B means that there is insufficient evidence to justify their present acceptance, but there is reasonable evidence of their usefulness and safety. These products meet the other qualifications and standards established by the Council on Dental Therapeutics.

The Council's initial consideration of products which may be eligible for Group B listing is influenced favorably by the knowledge of further investigations then in progress. It is the policy of the Council to reconsider Group B products each year on the basis of new evidence which may be produced in their support. Classification in this category is not ordinarily continued for more than three years.

GROUP C

Listing of products in Group C means that the evidence is so limited or inconclusive that the product cannot be accurately evaluated. It is the Council's opinion that Group C products require further study by qualified investigators.

GROUP D

Listing of products in Group D means that they are unacceptable because of their demonstrated inability to meet the standards outlined in the provisions for acceptance.

The state dental society council on dental care

COUNCIL ON DENTAL HEALTH

The following report is the third in a series which will comprise a manual on the development and operation of state councils on dental care, or equivalent agency. The first two reports appeared in the April and May issues of THE JOURNAL under the title "Methods of Payment for the Group Purchase of Dental Care: Policies of the American Dental Association," parts I and II.

In the early history of state society councils on dental health, their major responsibilities were the development and operation of the society's program of dental health education and the advancement of the dental division in the state health department. A change in the role of this agency is taking place to the accompaniment of socioeconomic changes that are affecting the role, not the responsibility, of the dentist and the dental society.

In the preamble to its *Principles of Ethics*, the American Dental Association states that the obligation of the dentist "cannot be reduced to a changeless series of urgings and prohibitions for, while the basic obligation is constant, its fulfillment may vary with the changing needs of a society composed of the human beings that a profession is dedicated to serve." In a section on "Service to the Public," it declares that "The dentist has a right to win for himself those things which give him and his family the ability to take their proper place in the community which he serves, but there is no alternative for the professional man in that he must place first his service to the public." In a section on "Leadership," it points out that "The dentist has the obligation of providing freely of his skills, knowledge and experience to society in those fields in which his qualifications entitle him to speak with professional competence. The dentist should be a leader in his community, especially in all efforts leading to the improvement of the dental health of the public."

The foregoing principles have guided the individual practitioners of dentistry in their development of the profession to its present position of acceptance. In the early years of this nation under a rural economy, emphasis was placed on the individual: the individual as a patient; the individual as a member of an individual community. Although the members of the dental profession grouped themselves into dental societies, it was for the purpose of exchanging professional information and of developing the professional and technical competence of the members. The dental society was the first source of continuing education for the dentist.

As the socioeconomic characteristics of the country changed with industrializa-

tion, emphasis shifted from the individual to the group, from the individual to the collective appraisal of various problems. Although the dentist's obligation has remained the same in the rural and industrial periods, the circumstances under which the obligation is met have changed. The greatest change has been in the relation between two people—originally the dentist and the patient—to a new relation between patients as a group and dentists as a group.[1] In the development of the group concept, the dental society has emerged as the primary agency through which the members express their obligation of leadership in matters affecting the dental health of the public. Through their professional organizations, dentists have enunciated policies as follows on dental health education, dental care and methods of payment for dental care.[2]

Dental health education should be carried on through appropriate state and community agencies to provide authentic information on health practices, to motivate people to assume personal responsibility for health and to inform them of the facilities available for dental care.

Dental care should be available to all regardless of income or geographic location as rapidly as resources will permit. Private and community programs should provide for priority treatment, prevention and control of dental disease in children, and for the elimination of pain and infection in adults. The community in all cases shall determine its methods for providing services.

Voluntary prepayment and postpayment plans consistent with sound experience should be developed as rapidly as possible. A federal compulsory health insurance program should be opposed on the ground that it is not in the interest of the public or of the profession.

ROLE OF DENTIST

In the new concept of dental health as an integral part of total health, the dentist has assumed a new position as a member of the health team. He no longer thinks in terms of treating individual lesions of the teeth, the gums or other oral tissues. Rather, he is concerned with comprehensive management of the prevention, repair and restoration of oral, facial and speech defects: with the health of the oral structures and tissues in their relation to the ability of the individual to communicate with his environment through socially acceptable speech and expression; with the physiologic characteristics of the oral tissues in the indication of systemic disease; with the stabilization of the oral structures in physiologic functional occlusion to protect the health of the oral tissues themselves; with the relation of functional occlusion to digestion and nutrition.

The attainment of functional dental occlusion "is more than the harmonious static arrangement of the teeth in the dental arches. It is the interrelationship of all of the component parts of the masticatory system in motion during such useful normal functions as facial expression, speech, mastication and swallowing. It involves the teeth and their supporting tissues, the bones of the jaws, the temporomandibular joints and the masticatory musculature as well as the supporting and specialized tissues of the masticatory system."[3] Although many of the individual problems of such comprehensive management require the specialized skills and knowledge of other professions such as the plastic surgeon or the speech pathologist, the dentist must be the nucleus of any team approach to the problem.

ROLE OF DENTAL SOCIETY

If the dentists of this country are to fulfill their obligations as stated in the *Principles of Ethics* and in policies of the American Dental Association, they must develop effective agencies through which they can act as a group. Such action is necessary to develop sound principles and methods for adapting the group principle to the established high standards of ethical private dental practice.

The dental society is the agency to

bring the voluntary efforts of all segments of the profession—education, research, private practice, public health practice—to bear on the development of voluntary plans and programs for dental care. Under the system of government in the United States, the control of most of the factors involved in the provision of health care rests with the state governments. It is essential, therefore, that state dental societies assume the major role in the development of dental care programs. They are the agencies to which the public will look for advice on problems of dental health. They are the agencies which can provide, most effectively, the advice which the people seek through their voluntary organizations or state governments. Their advice is essential if the resulting plans or programs are to be in the best interests of the public and the profession.

The increased public demand, expressed individually and through organized groups, for health care and for improved methods for meeting the costs has stimulated experimentation in the application of the group concept to the provision of medical and hospital care. In the past few years, it has become clear that the public is becoming aware of the benefits of good dental health and is interested in the availability of group purchase plans for dental care.

The adequate distribution of dental care to all segments of the population involves three important factors. They are the same factors which determine the adequate distribution of any product or service: (1) the consumer of care, the public, must be made aware of and convinced of the vital importance of positive dental health as well as early and regular dental care; (2) sufficient dental care must be available to meet the demand by the public; (3) the public must have available to it convenient methods of payment to meet the costs of dental care.

These three factors must be considered by a state dental society in developing its program for improving the production and distribution of dental care. The American Dental Association has recognized that, although these three factors are all part of the same problem, their individual characteristics lend themselves to separation into two parts as assignments to committees or councils. Such agencies will be most effective if the duties assigned to them are restricted to problems which have similar characteristics. The assignments to any one council will, of course, depend largely on the number of councils which the society is able to support with its manpower and financial resources. A large, well-organized society with adequate manpower will be able to establish more committees with well-restricted assignments than will the small society with a limited number of members, albeit qualified and interested. The latter may be forced to broaden the assignments to include unrelated problems.

The first factor in the distribution of dental care is the elevation of the dental health education of the public. It involves the development of information and of programs for dissemination and teaching which, in itself, can constitute a full-time assignment for a committee. In the early history of councils on dental health, as stated previously, their major responsibilities were the development and operation of the society's program of dental health education and the advancement of the dental division in the state health department. With few exceptions, even those state councils authorized under their bylaws to consider the problems of dental care have devoted little or none of their efforts to dental care programs. Since the nature of dental health education activities requires a particular interest, knowledge and skill different than do the other two factors in the distribution of dental care, the Council on Dental Health recommends that those state dental associations, which have a large enough membership and resources ade-

quate to do so, establish a council or committee on dental health education to manage their dental health education programs. If the membership of the society is not large enough to support a separate council on dental health education, it may be necessary to add the responsibility for the society's dental health education program to the duties of the council on dental health.

The American Dental Association's Bureau of Dental Health Education is prepared to assist the state societies in the development of their dental health education programs. This assistance includes the provision of basic materials for program planning, and the Bureau invites the societies to make maximum use of the service.

The remaining two factors in the problem of increasing the production and distribution of dental care are closely related and require the same kind of interest and skills of committee members who will be assigned the responsibility for developing information and policy on them. It is suggested that the title of this second agency be "council (or committee) on dental care." The name is descriptive of its assignments and activities and fits the pattern for their disposition. Where societies have had a council on dental health, they almost invariably establish a special or standing committee on dental care to handle the problems of methods of payment. This reaction, undoubtedly, is related to the acceptance of dental health education as the traditional responsibility of the American Dental Association's Council on Dental Health.

COUNCIL STRUCTURE

The duties of the Council on Dental Health of the American Dental Association, as approved by the House of Delegates in 1958,[4] are as follows:

a. To study, develop and compile information on plans and programs designed to increase the availability of dental care to all segments of the population by increasing the efficiency of private dental practice to meet the demand for dental care and by improving methods for meeting the costs of dental care.

b. To assist constituent societies and other agencies in the development of programs and policies related to public health and to increasing the availability of dental care to the public.

Under the foregoing assignments, as stated in the *Bylaws*, the Council has concentrated its efforts on the consideration of programs for increasing the availability of dental care to all segments of the population through the facilities of private practice. These activities involve two major areas of consideration:

1. Increasing the efficiency of dental practice as a method for distribution of dental care.

2. Improving the methods for meeting the costs of dental care.

3. Assisting state dental societies and other agencies in the development of their programs in the foregoing areas as well as those related to the improvement of public health administration.

The problems involved in the first two areas are directly related to the conduct of dental practice and are quite different from those involved in the development of programs for dental health education. It seems only natural, then, that in solving such problems, the dental societies have looked, generally, to sources of leadership other than their councils on dental health and have established separate agencies within their administrative patterns. Most dental societies have organized committees under such titles as "practice plans," "dental practice," "social research" and, in some instances, have established separate committees to handle the problems of individual dental care programs—for example, Veterans Administration, public assistance and budget payment. A few societies have held these programs within the frame-

work of their councils on dental health by establishing a subcommittee on dental care.

The Council believes that, on the principle of like structure for like function, state society councils or committees should be developed as state counterparts of the national Association's agencies. Under such an arrangement, there can be a logical flow of communication from national unit to state unit and vice versa. The Council feels also that the primary assignment of the state society's like agency should be the consideration of problems related to the availability of dental care, along with the development of recommendations to the society for proper solutions. In addition, it recognizes that in small societies the council on dental care can be assigned the responsibility also for conducting the society's program of dental health education as a problem related to dental care. Experience has shown, however, that the assignment is best restricted to the problems of dental care if at all possible.

It would seem, then, that with the substitution of the word "component" for "constituent," the statement of duties in the *Bylaws* of the American Dental Association for its Council on Dental Health could be adopted by state societies in establishing the basic assignments of their councils on dental care. If the society is not large enough to support a separate council on dental health education, the following section could be added:

c. To conduct the dental health education program of the society.

Size of Council • The Council has given consideration to the restrictions of manpower in some of the smaller societies, the difficulties inherent in the distances which members may have to travel for meetings and the financial resources of the society. The foregoing factors tend to limit the small society's administrative capacity for developing information on which to establish policy in the management of dental care programs. The Council believes that all dental societies should investigate the possibility of having certain administrative services furnished at cost by large societies to smaller societies in neighboring states. As an example, a large society, through its central office, might handle mailings and tabulations of survey questionnaires, charging small societies the actual costs of the services; likewise, a large society might extend its state dental health conference to include participation by other state councils on dental health in its region.

Depending on the financial and manpower resources of the society, it may elect to establish either a five-man or nine-man council on dental care. The advantages and disadvantages of both should be considered.

A five-man council has the advantage of costing less money for the same number of meetings per year as a nine-man council or for more meetings per year on the same budget. It is usually easier to reach agreement in controversial areas with a smaller group. Some difficulty may be experienced in obtaining adequate geographic representation and, consequently, communication to local districts in regard to council business may be less effective. In any event, however, geographic distribution should not take priority over such qualifications as ability, interest and experience of the nominee.

A nine-man council has the advantage of greater geographic distribution and the possibility of establishing subcommittees of three members each in the areas of: (1) dental practice, (2) methods of payment and (3) component society activities in dental care. Such subcommittee function would allow one full council meeting a year, supported by a meeting of each subcommittee devoted to its respective area of assignment. Subcommittee activity would allow also for specialization since restricted responsibility of individual members would encourage their complete familiarity with their as-

signed areas. A nine-man council has the disadvantage of being more expensive to operate.

Bylaw Support • It is desirable that duties, responsibilities and regulations, which are common to all councils of a dental society, be prescribed in the opening sections of the chapter of the society's bylaws dealing with councils or committees. These sections should specify such matters as number of members; requirements for eligibility; method of nomination; election procedure; term of office; filling of vacancies; authorization and utilization of consultants, advisers and additional personnel; definition of quorum; reimbursement of expenses, and duties common to all. Specifying the common duties and responsibilities accentuates the fact that all of the councils of the society draw their power from and are responsible to the same legislative and administrative authority of the society. It also gives emphasis to the common objectives of the councils and the necessity for cooperative action in the management of their individual responsibilities.

If there is no common provision of general stipulations for councils, then the foregoing specifications may be detailed in a section describing the composition and duties of the council on dental care as outlined in the following paragraphs.

MEMBERSHIP. The council shall be composed of [5 or 9] members. Nominations shall be made by the administrative body. Additional nominations may be made by the [legislative body]. Members shall be elected by the [legislative body] in accordance with the procedure established in the bylaws.

This method of nomination and election provides for a balance of control and should assure the objective selection of the best qualified members for the council. Leaving to the legislative body the power to elect will give further assurance of the quality of membership of the council. Alternative methods are for the president to appoint the new members to the council or for the new members to be elected to the council by the administrating body. Consideration should be given to the fact that the administrative body must understand the council's program and personnel needs and must nominate members who are qualified to conduct the business of the council. Although there is no method of selection that will guarantee successful democratic function, there are several important criteria which cannot be ignored without inviting failure:

1. The members must favor the basic objectives and policies of the dental society and the council.
2. The members should have a demonstrated interest in some phase of the council's assignment.
3. The members should be familiar with and sympathetic to the group method of problem management.
4. The members should represent the different opinions which exist in the dental society relative to the assignment of the council.
5. The council should have a chairman who has the ability to stimulate maximum participation of the members, to provoke complete consideration of all possible facets of the problem involved and to lead the council to the most effective solutions and recommendations.

The term of office could be specified as follows:

TENURE. The term of office of members of the council shall be three (3) years each, with consecutive tenure limited to two (2) terms of three (3) years each.

Establishment of a rotational method of appointment as well as provision for continuity of service of council members, by limiting a third of the initial appointments to one-year terms and a third to two-year terms, will assure a balance of experience and new enthusiasm.

While the foregoing criteria will be of assistance to the administrative body in

the choice of personnel, the selection must be made from individuals who are eligible. Active membership and payment of association dues are usually the basic requirements for eligibility. Therefore, the following statement would suffice:

ELIGIBILITY. Members of the council must be active members of the association.

The council chairman should be appointed by the administrative body, and the bylaw might be stated as follows:

CHAIRMAN. One member of the council shall be appointed annually by the [administrative body] to serve as chairman.

The selection of a council chairman should be based on qualifications alone, and he should have sufficient political freedom and strength to insure the development of a program designed for the common good. His election should indicate his knowledge of the problems within the council's purview and his competence in the political aspects of organized dental activity. During council deliberations, he must be able to develop a climate that will encourage free discussion, thus insuring effective decisions.

Provision should be made also for succession in the event of a vacancy in the membership or chairmanship of the council. Such provision might be covered as follows:

VACANCIES. In the event of a vacancy in the membership of the council, the president of the society shall appoint a member of the association possessing the same qualifications as established by these *Bylaws* for the previous member to fill such vacancy until a successor is elected by the [legislative body] for the remainder of the unexpired term. In the event such vacancy involves the chairman of the council, the president shall have the power to appoint an *ad interim* chairman.

The number of council members required to be present at meetings for the legal transaction of business should be specified. The following definition of a quorum is suggested:

QUORUM. A majority of the members of the council shall constitute a quorum.

The council should be required to submit periodic reports on its activities. They should include the council's own evaluation of its program, suggestions for any indicated reorientation of that program and recommendations for changes in the bylaws, if necessary, to permit consideration of new problems. The bylaw might read as follows:

COUNCIL REPORTS. The council shall submit, through the society secretary, a semiannual [or quarterly or other] report to the [administrative body] and an annual report to the [administrative and legislative bodies].

When such reports are presented to the [legislative body], the council chairman and members should have the right to participate in any debate whether they are members of that body or not. Provision for such privilege may be covered by the following bylaw:

PRIVILEGE OF THE FLOOR. The chairman and members of the council who are not members of the [legislative body] shall have the right to participate in the debate on their respective report but shall not have the right to vote.

The council should submit an annual appropriation request for budget to support its program. In developing budget requests, the council should keep in mind the requirement of travel and per diem for official meetings as well as visits to component societies in order to give them advice and assistance. It should also consider the need for consultation with representatives from other professions and from business. In addition, adequate budget should be obtained for an annual working conference, similar to the National Dental Health Conference. It is not always possible to obtain the desired individuals to present papers without at least reimbursing them for their expenses. This budget item should also cover publication of the proceedings of the conference, either as a separate item or in the journal of the society. The journal should also carry periodic reports on the

society's official policy in the area of dental care. The bylaw stipulation for annual budget requests might be worded as follows:

PROPOSED BUDGET. The council shall submit to the [administrative body], through the society secretary, a proposed itemized budget for the ensuing fiscal year.

In discharging its primary assignment, a council on dental health will need to have the advice and assistance of many individuals in special fields, such as business management, banking, architecture, insurance, equipment design, auxiliary personnel relations, public assistance, sociology and so on. The present and future problems of increasing the availability of dental care will not be susceptible to solution by dentists alone. Councils should, therefore, include in their budgets funds for making consultation available in the areas of their activities. Consideration should be given to obtaining this advice at a minimum cost, but the society should not be in the position of seeking consultation at the expense of the consultant. The following bylaw will provide the mechanism for such personnel:

CONSULTANTS AND ADVISERS. The council shall have the authority to nominate consultants and advisers in conformity with rules and regulations established by the [administrative body].

The council should have the necessary staff support to perform its normal housekeeping and communications functions. As the council's program develops, it is quite likely that the details will outgrow the limitations of a volunteer council and the existing staff of the society. The employment of a staff secretary for the council might make it possible for a larger society to make certain administrative services available to smaller societies in the region. The bylaw provision could be worded as follows:

SECRETARY. In the event a council secretary is an employee, his employment shall be subject to the approval of the [administrative body].

The foregoing bylaws indicate the provisions that should be considered by a state society in establishing a council on dental care. Since they would apply to all councils of the society, they could be listed in the opening section of the chapter relating to councils and committees, with specific duties of the respective agencies following. Accompanying this report are copies of bylaws that have been adopted by two state societies in the recent reorganization of their councils on dental care. The titles they selected for this agency are examples of the adaptations that may result in meeting local needs.

COUNCIL COMMENT

In order to increase the availability of dental care to all segments of the population, the profession will require strong, well-supported state dental societies that (1) through the group voice of their members, can provide the same high quality of professional advice and assistance to public groups and agencies as the individual dentist renders his individual patients; (2) with effective, well-supported agencies, can develop information on the production and distribution of dental care; (3) with well-developed and utilized channels of communications, may keep their members informed on the social and economic developments which will affect the operation of their practices.

Programs for state councils on dental care, or equivalent agencies, will be discussed in the next two issues of THE JOURNAL.

1. Hillenbrand, Harold. Dentistry's responsibility in the changing socioeconomic pattern. J.A.D.A. 54:164 Feb. 1957.
2. American Dental Association. Official policies of the American Dental Association on dental health programs. American Dental Association, Chicago, 1957, p. 7, 9.
3. Friedrich, Rudolph H. Dentistry in hospitals. J. American Hospital Association 36:39 May 1957.
4. American Dental Association. Transactions 1958, p. 60.

OREGON STATE DENTAL ASSOCIATION

The following amendments to the *Bylaws* of the Oregon State Dental Association were approved by its Executive Council in January 1960 and by its House of Delegates in March 1960:

Amendment to Chapter VIII. Committees.

Section 10. To this section will be added *Council on Dental Care*. Said Council on Dental Care will assume duties of those committees to be deleted under this amendment; Committees on Dental Health, Economics, Post Payment Dental Plans, and Group Dental Care.

Section 20. Composition, Appointment.
To be added; x F. (To read) Council on Dental Care. The Council will be composed of six (6) members, a chairman, the chairman of the three committees composing the Council, to wit, Dental Health Education, Dental Practice, and Methods of Payment, and two (2) members-at-large. The chairman of the Council will be designated annually by the President of the Oregon State Dental Association. Tenure of term will be for three years. No member will be appointed for more than two consecutive terms. Initial appointments will be; two members for one-year terms, two members two-year terms, and two members for three-year terms.

Section 50. Duties.
To be added; *Council on Dental Care*. Duties.

1. To study, develop and compile information on plans and programs designed to increase the availability of dental care to all segments of the community by increasing the efficiency of private dental practice to meet the demand for dental care and by improving the methods for meeting the cost of dental care. 2. To assist the component societies and other agencies in the development of programs and policies related to public health and to increasing the availability of dental care to the public.

The duties of the committee under this Council will be:

1. Dental Health Education. It shall be the duty of this committee to work in the area of developing programs for the mass distribution of health education through Children's Dental Health Week, school dental health education programs, dental health educational programs, speakers' bureaus, and other related educational activities. This committee will also act as a consultant committee to the dental division of the Oregon State Board of Health.

2. Dental Practice. It shall be the duty of this committee to organize and conduct such surveys and statistical studies as may relate to the economic interests of the profession and the community. Such surveys will also determine the manpower distribution of dentists with the objective of providing the best possible availability of dental service to the community. This committee will study the field of dental practice as pertains to those factors in the conduct of private practice which may provide greater efficiency of service, thus increasing availability of dental service to the community.

3. Methods of Payment. The duties of this committee will be the study and development of post and pre-payment plans; said plans being consistent with policies of the American Dental Association and having the endorsement of the Oregon State Dental Association. Duties of sub-committees included under Methods of Payment Committee will be:

A. Post Payment Plans Sub-committee.
Post Payment Dental Plans: The duties of the Post Payment Dental Plans Committee shall be to act as a liaison committee between members of this Association and those agents authorized to financially administer Post Payment Dental Plan programs in the State of Oregon. They shall make a continuous study of post payment dental plans and advise this Association of their findings.

B. Group Dental Care Sub-committee. Duties will be to investigate and study plans and development of group dental care programs in operation in the United States. To act as consultants to Oregon Dental Association endorsed group dental programs in effect in the State of Oregon; and to advise the Oregon State Dental Association with respect to proposed group dental care programs that may be offered for dental service in Oregon.

C. Public Assistance. Duties will be to study the programming of dental service to the indigent and/or those unable to assume dental service through private means. This subcommittee will act as consultant agency to

those component societies which have established programs with this objective. This committee will also act as a consultant committee to the dental division of the Oregon State Welfare Commission.

The Council shall act for the Association in such matters assigned to it by the Executive Council of the Association.

The Council on Dental Health shall act in an advisory capacity to and as a liaison between the State Dental Association and the Bureau of Dental Health of the state government's Division of Health.

Each district shall have a district Council on Dental Health and its chairman shall automatically become a consultant to the State Council on Dental Health.

MISSOURI STATE DENTAL ASSOCIATION

Bylaws

COUNCIL ON DENTAL HEALTH—The Council on Dental Health shall be composed of five members. They shall be nominated and elected by the Executive Council of the State Dental Association to serve the following terms: One for one year, two for two years and two for three years and thereafter as each term of office expires replacements shall be made for three-year terms. No member shall serve more than two three-year terms on the Council on Dental Health.

The Executive Council of the Missouri State Dental Association shall elect the chairman of the Council on Dental Health from among the Council's membership to serve for 1 year.

The Council on Dental Health shall give a written report to the Executive Council annually and such further reports as the Executive Council requests.

The Council on Dental Health shall submit in writing to the Executive Council a proposed itemized budget of anticipated expenditures for the ensuing fiscal year.

The Dental Director of the Bureau of Health of the State government's Division of Health shall be an ex-officio member of the Council on Dental Health.

The chairman of each district Council on Dental Health shall be a consultant to the State Council on Dental Health. Other consultants may be appointed when necessary.

The duties of the Council on Dental Health shall be to study, design and develop plans and methods to improve dental health services in relation to:

1. The capacity of dental practice to meet the demand for dental care.
2. The problems associated with meeting the costs of dental care.
3. The understanding of dental health by the public.
4. The appreciation of the benefits of dental care by the public.

The Council shall recommend policies concerning dental health services to the state Executive Council and shall develop its program within the approved policies of the American Dental Association and the Missouri State Dental Association.

Survey of dentist opinion
VIII. Summary

BUREAU OF ECONOMIC RESEARCH AND STATISTICS

As a means of determining the opinions of dentists on a variety of topics, a six-page questionnaire was sent in November 1958 to every fifth civilian dentist in the United States. The return of 28.6 per cent was better than is realized in most mail surveys.

The percentage of dentists returning questionnaires was almost identical for all regions of the country. There was an under-response of dentists in towns of less than 2,500 population and of dentists not members of the Association. Since the number of dentists in these categories is small, the under-response does not seriously affect the validity of survey results. In general, so far as can be determined, the characteristics of the respondents were very similar to those of all civilian dentists.

DENTAL HEALTH EDUCATION

Most dentists checked more than one reply to the question "whose responsibility do you think it is to educate the public in matters of dental health?" More than 90 per cent checked "dentists;" nearly 70 per cent checked "schools;" "health departments" was checked by a little more than half and "community health committees" by about one third. To the question "how do you think public appreciation for dental care can best be improved?" about half checked "education by means of radio and television programs," one third "patient education by the dentist," one third "education through school health programs" and one fifth "education through the press." The preference for education through radio and television programs was especially strong among younger dentists, whereas more of the older dentists believed "patient education by the dentist" to be most effective.

Three fourths of the respondents indicated they presented dental health educational materials to their patients. Of these dentists, nearly four out of five presented materials prepared by the American Dental Association. Half of the dentists used materials prepared by commercial organizations and about one third used materials prepared by state health departments.

The practice of recommending a specific brand of dentifrice to their patients was reported by 18.8 per cent of respondents. To the question "approximately what proportion of your patients have asked you to recommend a brand of dentifrice?" the median reply was one fourth. Dentists were asked what source

of advice would influence them most in deciding to recommend a specific brand of dentifrice, and eight out of nine dentists checked "advice from the American Dental Association."

DENTAL FEES

In reply to a question on how the dentist arrived at the fees he was charging, two responses were each checked by nearly half of the respondents: "by analyzing expenses and time required for each service" and "by charging what other dentists, of similar ability, in the community charge." "By following published fee schedule(s)" was checked by one out of seven dentists and "by charging what patients seemed to be willing to pay" by one out of 12 dentists. There were large differences in responses to this question according to age of dentist.

Nearly four out of five dentists thought that certain types of dental services performed by general practitioners should command a higher hourly net return than others. These dentists were asked to rank nine types of dental services according to the hourly net return they should command. There were substantial age differences in the ranks accorded to the various types of services. For all ages combined crowns and bridges ranked first; in second place were oral surgical procedures; third, root canal therapy; fourth, dentures; fifth, orthodontic treatment; sixth, fillings; seventh, periodontal treatment; eighth, routine extractions and ninth, prophylaxis.

DENTAL DRUGS

Survey participants reported that their principal source of information on types and brands of dental drugs was *Accepted Dental Remedies,* published annually by the Council on Dental Therapeutics. "Literature from drug companies" was a strong second and "detail men" a strong third. In the Southwest region, "detail men" ranked first. Nationally, among dentists 35 to 44 years of age "literature from drug companies" ranked first.

Eight out of nine dentists indicated they prescribed antibiotics; this practice was more common among the younger than the older dentists. Three out of ten dentists answered "yes" to the question "do you dispense antibiotics to the patient in your office?"

Asked to list the antibiotics prescribed or dispensed, in order of frequency, dentists listed the penicillins first more often than any other type of antibiotic, followed by the tetracyclines.

DENTAL LABORATORIES

Nine out of ten dentists replied in the affirmative to the question "when you send work to a commercial dental laboratory, do you, as a general rule, submit written instructions?" Asked whether they thought dentists should be required by law to submit written authorization for work delegated to commercial dental laboratories, more than eight out of 10 dentists checked "yes."

Nationally, only 31.5 per cent of the respondents thought "the unlawful practice of dentistry by non-dentists" was a serious problem in their community. The regional variation in this percentage was from 17.7 per cent in the Northwest to 47.7 per cent in New England. By city size, the variation was from 13.3 per cent of dentists in places of 1,000 to 2,500 population to 57.2 per cent in cities of over 1,000,000 population.

Dentists were asked to suggest methods that should be used to prevent the illegal practice of dentistry by non-dentists. The majority of replies called for rigorous legislation and law enforcement and heavy penalties for persons performing dentistry illegally.

More than eight out of ten dentists replied in the affirmative to the question "do you think that members of the dental laboratory craft should be invited to

meetings of the local dental society when laboratory technics are being discussed?"

RECIPROCITY

Dentists were asked "do you think all states should have licensing reciprocity, so that a dentist licensed in one state could become licensed in another by taking and passing only a practical examination?" Nationally, 76.9 per cent of the respondents checked "yes." In only one region, the Far West, did dentists vote against universal reciprocity.

DENTAL MAGAZINES

The dentist was asked how much he read, and how he rated in several respects, the three mass circulation dental magazines: THE JOURNAL OF THE AMERICAN DENTAL ASSOCIATION, *Dental Survey* and *Oral Hygiene*. The mean number of issues read during a year by Association members was 8.7 for *Dental Survey*, 8.8 for *Oral Hygiene* and 10.2 for THE JOURNAL. The mean number of minutes spent reading each issue was 37.7 for *Dental Survey*, 37.0 for *Oral Hygiene* and 76.5 for THE JOURNAL.

Asked to check their magazine of choice with respect to eight factors, the largest percentage of members chose THE JOURNAL for scientific articles, news of dentistry, amount of advertising read, confidence in advertising, filing of magazines or filing of magazine articles. The majority of members also chose THE JOURNAL as their "favorite" dental magazine and as the "most beneficial" dental magazine. *Dental Survey* was the magazine of choice for articles on practice management, followed by *Oral Hygiene*. The preference for THE JOURNAL was particularly strong among the younger dentists and among specialists.

Dentists were asked to give their opinion as to the amount of material appearing in the scientific section of THE JOURNAL on various topics. For most topics, the plurality of members checked "amount about right." Just over half of the members indicated there should be more material on dental economics and practice management.

To the question "does THE JOURNAL OF THE AMERICAN DENTAL ASSOCIATION in its present form fully meet your needs for a general dental magazine?" a little over half of the members checked "yes," about one third checked "no" and the remainder did not reply. Among those who answered the question, 60 per cent checked "yes."

ORAL ROENTGENOLOGY

Of the dentists who answered the question on number of x-ray machines, only 3.3 per cent did not own a machine. Eighteen per cent owned more than one machine.

The mean age of x-ray machines was 9.6 years. This varied with age, however, from 3.4 years for dentists under 30 to 16.2 years for dentists 65 and older.

The survey yielded information related to amount of radiation exposure, including amount of filtration, collimation, length of timer cord and distance the respondent stood from the patient's head during exposure. The large majority of dentists reported using fast x-ray film. One of every 13 dentists subscribed to a film badge service at the time of the survey. Of the remainder, 17.3 per cent indicated they had used a film badge service at some time in the past.

About three fourths of the dentists reported that during recent years some of their patients had shown increased concern over dental x-rays as a health hazard. Asked to estimate the proportion showing increased concern, half of the respondents estimated one tenth or less. The mean number of patients refusing to have x-ray pictures taken during the preceding year because they were considered dangerous to health was only 2.5. Two thirds of the dentists owning x-ray

machines reported no change during the preceding year in the amount of usage of x-rays, one fifth reported an increase and one tenth reported a decrease.

The large majority of dentists indicated they "never" held the film in the patient's mouth while the x-ray was being taken. However, 9.1 per cent said they did so "occasionally" and 0.4 per cent "frequently." Seventeen per thousand dentists indicated they had experienced an x-ray burn on their fingers, the burn occurring, on the average, 14.5 years after they started using dental x-ray. None of the dentists under 30, but about 5 per cent of the dentists over 60, had experienced an x-ray burn.

DENTAL MATERIALS

Most of the questions on dental materials asked for information on troubles the dentist had had with certain materials. The fact that relatively few dentists answered the questions on materials suggests that they are rather well satisfied with materials currently used and probably have forgotten the brands with which they have had trouble in the past.

The hygroscopic type of inlay casting investment was preferred by about twice as many dentists as was the thermal type, because the dentist had been "taught to use it," "had no experience with the thermal type" or "it gives satisfactory results." However, accuracy, controlled expansion and smooth casting were attributed more often to the thermal than to the hygroscopic type.

Dentists preferred "gold colored" to "white gold" wires for clasps and orthodontic appliances by a margin of nearly two to one. Tarnishing, discoloration and brittleness were the most common complaints regarding both white gold and gold colored wires.

Most of the troubles dentists reported with alginate hydrocolloidal impression materials related to setting time, and more dentists mentioned that setting time was "inconsistent" than mentioned it was "too slow" or "too fast." "Roughness of the model surface" was also mentioned relatively frequently.

"Lack of color stability" was mentioned most often as an unsatisfactory property of denture lining resins.

"Cutting porcelain" or "grinding denture teeth" was the purpose for which most dentists used diamond stones. The wheel-shaped stone was preferred by more dentists than any other of numerous shapes mentioned.

ASSOCIATION ACTIVITIES

Respondents were asked "Do you have any comments or criticisms to make of the activities and programs of the American Dental Association? Are there any programs that you think the American Dental Association should begin or expand?" Thirty per cent of the respondents wrote in a comment, but this figure was higher for younger dentists and considerably lower for older dentists.

Of all comments made by Association members, 41.0 per cent were to the effect that public dental education should be increased. Of the specific media or programs of public education suggested, television and radio were suggested most often and newspapers were next.

The second largest category of comments related to services provided by the Association for individual dentists. This category included suggestions to expand or initiate programs of information on dental drugs and materials, dental fees, practice management, insurance and retirement plans. There was significant variation by age and region in the nature of these suggestions.

The third largest category of comments consisted of general evaluations of the Association's over-all program rather than specific suggestions. About four times as many members stated the Association was "doing a good job" as stated it was not doing a good job.

The fourth ranking group of comments dealt with the Association's relationship with its members. Most of these comments were either that greater effort should be made to listen to minorities and individual members or that the Association should improve its downward communications with members.

Among the other comments, the desire for licensing reciprocity among all states was prominent, as was the request for a vigorous campaign against misleading dentifrice advertising claims. One of every 36 comments asked for a vigorous fight against illegal dental laboratory activities and one of every 40 asked for more activity in development of dental prepayment or postpayment plans.

This survey has yielded information of significance to various agencies for use in program and policy development. It appears desirable to conduct a Survey of Dentist Opinion periodically, both to determine trends in some of the questions covered in this survey and to obtain information on other subjects.

The 1959 survey of dental practice
III. Income of dentists by type of practice, personnel employed and other factors

BUREAU OF ECONOMIC RESEARCH AND STATISTICS

Table 3 in Chapter II showed a wide variation in the incomes of dentists. The tables on income according to state, city size and age accounted for much of the total variation. More of the total variation is accounted for in this chapter, particularly by type of practice and personnel employed.

INCOME BY TYPE OF PRACTICE

Specialists as a group reported a mean net income of $19,640 for 1958, 47.8 per cent higher than the mean of $13,290 for general practitioners (Table 10). The mean net income of nonsalaried specialists ($21,244) was 56.0 per cent higher than that of nonsalaried general practitioners ($13,619). Nearly one out of five nonsalaried specialists had a net income greater than $30,000, compared to one of every 50 general practitioners (Table 11). Salaried specialists had a mean net income of $10,688, 17.1 per cent higher than the mean of $9,128 for salaried general practitioners (Table 10).

Among the specialists, orthodontists reported the highest mean net income ($23,426), followed by periodontists ($20,106), oral surgeons ($18,263) and pedodontists ($16,432). Averages for nonsalaried specialists were higher, particularly for pedodontists. The greatest increase in net income between 1955 and 1958 was reported by periodontists.

The expense ratio for nonsalaried orthodontists was relatively low (35.5 per

Table 10 • Average income of dentists by type of practice, 1958

Type of practice	All dentists			Nonsalaried dentists						
				Net income					Mean gross income	Net as per cent of gross
	Per cent of respondents	Mean net income	Median net income	Mean	Median	Standard deviation	Coefficient of variation	Standard error of the mean		
General practitioner	89.5	$13,290	$12,664	$13,619	$13,005	$ 6,223	45.7	$ 123	$25,070	54.3
Specialist	10.5	19,640	17,250	21,244	18,983	12,370	58.2	770	35,861	59.2
Oral surgeon	2.4	18,263	17,350	18,492	17,850	7,947	43.0	2,312	35,852	51.6
Orthodontist	3.9	23,426	20,975	25,052	23,975	12,798	51.1	1,214	38,821	64.5
Pedodontist	1.5	16,432	14,200	19,600	16,100	14,618	74.6	2,624	34,342	57.1
Periodontist	1.0	20,106	16,300	*	*	*	*	*	*	*
Other specialists	1.7	14,120	12,500	14,793	13,600	7,483	50.6	1,415	26,793	55.2
All types of practice	100.0	$13,956	$12,982	$14,311	$13,366	$7,362	51.4	$ 139	$26,030	55.0

*Too few replies for reliable statistics.

Table 11 • Percentage distribution of nonsalaried dentists according to net income, by type of practice

Net income	Type of practice						
	General practitioner	All specialists	Oral surgeon	Ortho-dontist	Pedo-dontist	Perio-dontist	Other specialists
Loss: $1–$3,400	.3	.0	.0	.0	.0	.0	.0
$1–$4,949	6.6	3.8	1.6	3.6	6.4	3.8	7.2
$4,950–$9,949	21.9	10.8	15.6	7.2	6.4	15.4	14.3
$9,950–$14,949	33.8	17.3	18.8	8.1	22.6	23.0	39.2
$14,950–$19,949	22.0	20.5	26.6	17.1	29.1	7.6	21.5
$19,950–$24,949	10.3	16.1	14.0	16.2	16.1	30.9	7.1
$25,950–$29,949	3.2	13.1	10.9	21.6	9.7	.0	.0
$29,950 and up	1.9	18.4	12.5	26.2	9.7	19.3	10.7
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Table 12 • Mean income of nonsalaried dentists with specified number of chairs and number and type of full-time employees, 1958

Number of chairs and number and type of full-time employees	Mean net income	Mean gross income	Net as per cent of gross
1 chair, no employees	$ 8,469	$14,065	60.2
1 chair, 1 assistant	12,872	22,261	57.8
2 chairs, no employees	9,958	15,514	64.2
2 chairs, 1 secretary or receptionist	16,196	26,380	61.4
2 chairs, 1 assistant	14,094	24,779	56.9
2 chairs, 1 assistant and 1 secretary or receptionist	19,934	36,285	54.9
2 chairs, 2 assistants	21,015	36,451	57.7
2 chairs, 1 hygienist and 1 or 2 of the following: technicians, assistants, secretaries and receptionists	17,323	35,085	49.4
3 chairs, 1 assistant	14,524	25,580	56.8
3 chairs, 1 hygienist and 1 or 2 of the following: technicians, assistants, secretaries and receptionists	18,000	39,188	45.9
4 chairs, 1 or more employees other than dentists	24,228	47,142	51.4

cent) and for oral surgeons it was relatively high (48.4 per cent). For general practitioners the expense ratio was 45.7 per cent and for specialists as a group it was 40.8 per cent.

INCOME BY PERSONNEL EMPLOYED, NUMBER OF CHAIRS AND UNITS

Among nonsalaried dentists having only one chair, those having one full-time assistant had a gross income 58.3 per cent higher, and a net income 52.0 per cent higher, than those without employees (Table 12). For dentists with two chairs and two assistants, both gross and net income were about 63 per cent higher than incomes of dentists with one chair and one assistant.

The income of dentists according to number of employees, without regard to type of employee or number of chairs,

Table 13 • Mean income of nonsalaried dentists by number of employees, 1958

Number of employees		Mean net income	Mean gross income	Net as per cent of gross
Full time*	Part time*			
0	0	$ 9,011	$14,795	60.9
0	1	9,581	16,519	58.0
0	2	11,595	20,352	57.0
0	3	16,647	32,307	51.5
1	0	13,745	24,149	56.9
1	1	15,851	28,500	55.6
1	2	15,227	30,004	50.7
1	3 or more	17,600	35,108	50.1
2	0	18,399	33,821	54.4
2	1	18,683	36,693	50.9
2	2	19,657	39,477	49.8
3	0	21,540	44,600	48.3
4 or more	0	28,649	61,586	46.5
All nonsalaried dentists		$14,311	$26,030	55.0

*"Full time" means full-time positions occupied all year, and "part time" means either part-time positions or positions filled only part of the year.

Table 14 • Average income of nonsalaried dentists according to number of dental chairs and units used, 1958

Number of chairs and units	Per cent of dentists	Mean net income	Median net income	Mean gross income	Net as per cent of gross
1 chair	28.3	$10,347	$10,300	$17,919	57.7
2 chairs	53.4	14,792	14,000	26,292	56.3
With one unit	3.6	13,402	12,400	22,696	59.1
With two units	48.4	14,825	14,033	26,515	55.9
3 chairs	14.7	18,254	16,993	35,707	51.1
With two units	2.5	16,652	16,088	30,254	55.0
With three units	11.2	18,364	17,677	36,732	50.0
4 chairs	2.4	20,824	19,000	44,135	47.2
With four units	1.7	21,885	26,350	46,918	46.6
5 chairs or more	1.2	29,036	25,200	65,644	44.2
All nonsalaried dentists	100.0	$14,311	$13,366	$26,030	55.0

Table 15 • Mean income of nonsalaried dentists by number of dental units used, 1958

Number of units	Per cent of dentists	Mean net income	Mean gross income	Net as per cent of gross
0	1.1	$16,531	$30,977	53.4
1	31.7	10,726	18,611	57.6
2	52.5	14,905	26,690	55.8
3	11.9	18,367	36,901	49.8
4	2.0	21,744	46,150	47.1
5 or more	.8	*	*	*
All nonsalaried dentists	100.0	$14,311	$26,030	55.0

*Too few replies for reliable statistics.

Table 16 • Average income of dentists by number of weeks spent in all types of dental work, 1958

Number of weeks	All dentists			Nonsalaried dentists				Salaried dentists	
	Per cent of respondents	Mean net income	Median net income	Mean net income	Median net income	Mean gross income	Net as per cent of gross	Mean net income	Median net income
52	4.6	$11,198	$ 9,612	$12,080	$10,550	$22,652	53.3		
51	5.3	11,800	10,350	12,231	11,025	21,911	55.8	$10,704	$ 9,600
50	26.5	13,541	12,638	13,845	12,985	25,193	55.0		
49	13.2	14,670	13,792	14,722	13,810	26,481	55.6	11,013	10,525
48	21.9	15,400	14,483	15,510	14,712	28,297	54.8		
47	5.7	15,861	14,000	16,182	14,650	27,649	58.5		
46	6.3	16,872	15,525	16,426	15,300	31,020	53.0		
45	3.3	15,199	12,400	15,757	13,750	28,834	54.6		
44	2.6	15,877	14,000	16,523	14,783	29,352	56.3		
43	.6	*	*	*	*	*	*	11,658	9,900
42	1.5	16,816	15,700	17,183	16,400	32,092	53.5		
41	.4	*	*	*	*	*	*		
40	2.7	10,572	9,200	11,086	9,850	20,664	53.6		
Less than 40	5.4	6,285	4,010	7,143	4,105	14,122	50.6	4,226	4,000
All dentists	100.0	$13,956	$12,982	$14,311	$13,366	$26,030	55.0	$9,962	$8,951

*Too few replies for reliable statistics.

is shown in Table 13. It should be noted that in this table "part time" includes those full-time positions that were filled only part of the year.

Table 13 shows clearly that both net and gross income increase as number of employees increases. Gross income increases proportionally more than net income, and the expense ratio increases as number of employees increases.

Of the dentists having two chairs and one assistant, those with two dental units reported a mean net income of $14,281, compared to $11,729 for those with one unit.

In this survey, 71.7 per cent of the nonsalaried dentists had more than one dental chair, compared to 63.4 per cent in 1955 and 58.1 per cent in 1952 (Table 14). Sixty-seven per cent of the dentists had more than one unit (Table 15). The most common combination was two chairs and two units, reported by 48.4 per cent (Table 14). Nine out of ten dentists reported they had as many units as chairs.

Income according to number of chairs and units is shown in Table 14. Two-chair offices had a mean net income 43.0 per cent greater than one-chair offices, three-chair offices 76.4 per cent greater and four-chair offices 101.3 per cent greater.

INCOME BY NUMBER OF WEEKS WORKED

One out of 22 dentists worked 52 weeks during 1958 (Table 16). Nonsalaried dentists who worked 52 weeks had a mean net income of $12,080, 15.6 per cent below the average for all nonsalaried dentists. Dentists with higher incomes tended to work fewer weeks. For dentists who worked less than 40 weeks, however, income was much lower than average. This category includes the 1959 graduates, most of whom worked only a few months, and dentists who retired during the year.

The most common length of work year was 50 weeks (26.5 per cent), followed by 48 weeks (21.9 per cent).

The fourth article in this series will present information on professional expenses and auxiliary personnel employed.

editorials

Washington state dentists fight the attenuation of dental health service

For the past five months so-called "denturists" in the State of Washington have been promoting an initiative to license members of their vocation to deal directly with the public in the fitting and construction of dentures. The sponsors of the initiative—a copy of which is shown here—must secure approximately 100,000 signatures on or before July 8, 1960, in order to place the issue on the ballot in the election which will be held November 8. If the initiative is approved by the electorate, it becomes law and may not be amended by the state legislature for a two year period following the election. Thus would begin the attenuation of health care and the lowering of service standards which the profession has labored long to erect for the protection of the public.

The best method of opposing illegal and unqualified practice is to develop an informed profession and an informed public. This is the method being used by the Washington State Dental Association which has initiated an intensive campaign of counteraction. Every dentist in the United States, however,—and every dental society—must be alerted to the fact that the efforts toward illegal and unqualified practice are not restricted to the Northwest. They have developed in other areas and may develop again where least expected. Every dental society must be prepared to meet this challenge in the interests of the health of the public.

Official Petition -- Initiative No. 206

Important Instructions:

1. Only REGISTERED VOTERS may sign. SIGN ONLY ONCE.
2. Be sure every registered voter in your family signs. Women sign "Mary B. Smith" not "Mrs. John B. Smith."
3. Use either pen or pencil.
4. Every name counts. Return every petition no matter how few names are on it.

ALL PETITIONS MUST BE RETURNED BY JUNE 30, 1960 TO
W. H. (Jerry) McDONALD, 1011 8th AVE., SEATTLE 1, WASH.
OR 7536 12th N.E., SEATTLE 15, WASH.

FOR FURTHER INFORMATION TELEPHONE MAin 4-7014
Monday through Saturday 8 A. M. to 6 P. M.
Evenings, Sundays and Holidays, Phone LA 3-9982 or
INQUIRE AT 700 FIRST AVENUE, SEATTLE, WASHINGTON

WARNING

EVERY PERSON WHO SHALL SIGN THIS PETITION WITH ANY OTHER THAN HIS TRUE NAME, OR WHO SHALL KNOWINGLY SIGN MORE THAN ONE OF THESE PETITIONS, OR WHO SHALL SIGN THIS PETITION WHEN HE IS NOT A LEGAL VOTER, OR WHO SHALL MAKE HEREIN ANY FALSE STATEMENT, SHALL BE PUNISHED BY FINE OR IMPRISONMENT OR BOTH.

INITIATIVE PETITION FOR SUBMISSION TO THE PEOPLE

To the Honorable Victor A. Meyers, Secretary of State of the State of Washington: We, the undersigned citizens of the State of Washington and legal voters of the respective city, town or county set opposite our names, respectfully order and direct that

Initiative Measure No. 206

a full, true and correct copy of which is printed on the reverse side of this sheet shall be submitted to the legal voters of the State of Washington for their approval or rejection at the general election to be held on the 8th day of November, 1960, and each of us for himself says: I have personally signed this petition; I am a legal voter of the State of Washington, in the city (or town), and county written after my name, and my residence address is correctly stated.

OFFICIAL BALLOT TITLE

AUTHORIZING AND LICENSING "DENTURISTRY"

AN ACT defining and regulating the practice of denturistry; creating a new class of licensees known as denturists, defining denturists as persons who make, fit, and repair dentures for healthy and toothless human mouths and who are not licensed dentists; authorizing the employment of apprentices by denturists and providing for their registration; defining apprentices as persons of boys sixteen years of age who engage in denturist operations under the supervision of a licensed denturist; fixing standards, requirements and fees; creating a state board of denturistry and defining its powers and duties; and providing penalties.

	PETITIONER'S SIGNATURE (Don't Forget the Two Parts to Your Name)	Print Name Here for Positive Identification (Optional)	ADDRESS UNDER YOU ARE REGISTERED: Residence Address, Street and Number, or Rural Route and Box Number	City or Town Where Registered for Voting	County
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Canadian Dental Association and American Dental Association hold first joint meeting: an historic occasion

On the sixth and seventh of last month, Toronto's Royal York Hotel housed one of the most historic meetings ever held in the history of North American dentistry. On that occasion representatives of the American Dental Association met with representatives of the Canadian Dental Association to consider the many dental health problems facing the citizens of both countries and to explore many of the methods proposed for their solution.

Paraphrasing the opening remarks of both presiding officers, President William G. McIntosh of Canada and Paul H. Jeserich of the United States, "the conference will be recorded in dental history as one of signal importance. The joint participation in matters of science and service long since established and long enjoyed by members of the two organizations now is to be carried over into the common problems associated with the advancement of dentistry in North America and in the world as well."

After examining the complex of professional, social and legislative trends now influencing the practice of dentistry in Canada and the United States, the participants agreed that:

It is the responsibility of the profession to provide leadership in the field of dental health but the responsibility to provide more adequate and better distributed dental health services must be shared with all community agencies.

The tardy recognition by public agencies and by large segments of the public of the importance of dental health now confronts the profession with the need to provide more dental personnel through educational institutions which have been inadequately supported for many decades.

Many communities in both countries have failed in their obligation to take advantage of proved preventive measures such as fluoridation, which would bring about a profound improvement in the dental health of future generations. Fluoridation of public water supplies is a safe, inexpensive and effective method for controlling dental caries and can provide as much as 65 per cent decrease in the incidence of this widespread disease.

Adoption of such proved measures plus greater emphasis on dental health education of the public would permit the more orderly development and application of resources to meet public needs adequately.

Expanded programs for the training of all types of dental personnel, particularly dentists, should continue to be strongly encouraged, and governmental and other agencies should be urged to provide funds—specifically earmarked—for such expansion.

There is an immediate need for increased funds for broader dental research programs, and for the initiation of sound group purchase plans.

In the planning of any dental care program, priorities must be established to provide maximum health education and treatment for younger age groups—the soundest approach to the long-range improvement of the dental health of the total population.

Greater attention must be given to the integration of dental care into total health programs while maintaining high standards of dental service.

The Royal York meeting established a precedent. Let there be many more of a comparable character, held at fairly frequent intervals and devoted to raising the level of dental health and to improving methods of rendering the highest quality of dental service.

news of dentistry

U. S., Canadian dental officials meet; agree on need for more extensive public education program concerning the profession

The officers and trustees of the American Dental Association met with members of the executive board of the Canadian Dental Assocation May 6 and 7 at the Royal York Hotel in Toronto to discuss long-range plans for meeting the rising demand for dental health care in both the United States and Canada.

After the call to order by William G. McIntosh, president of the Canadian Dental Association, and the introduction of the representatives of the two associations, Canadian spokesmen presented a statement on the current dental problems and policy positions of the C. D. A. It was concerned largely with the dental situation in Canada's four western provinces—British Columbia, Alberta, Saskatchewan and Manitoba—much of which has been reported in earlier editions of THE JOURNAL (see pages 514 and 521, April 1960, and page 661, May 1960).

Spokesmen for the profession in this country then presented a statement on the current problems and policy positions of the American Dental Association. Briefly but adequately it highlighted the size and scope of the Association and its general policies and objectives. It presented background information on dental licensure, dental health expenditures and income in the United States, state dental practice acts, auxiliary dental personnel, dental education, research and public relations.

The conference participants considered a number of subjects of mutual interest: the scope and type of auxiliary personnel required to meet present and future objectives of the dental profession; the educational requirements for present and future types of auxiliary personnel; public relations problems requiring attention by the dental profession; professional problems which require attention from dental societies, and potential areas of cooperation by the two associations.

The conference was called for purposes of information only and no official conclusions were drawn and no official decisions or recommendations were made. The points unanimously but unofficially agreed on by the conferees are published

on page 798 of this issue.

Representing the Canadian Dental Association at the meeting were:

William G. McIntosh, president; James P. Whyte, president-elect; George M. Dewis, immediate past president; Remy Langlois, member of Executive; James Zimmerman, member of Executive; William Miller, member of Executive; M. Vincent J. Keenan, member of Executive; R. Arthur Rooney, chairman, Committee on Auxiliary Service and secretary, Alberta Dental Association; James D. McLean, chairman, Council on Dental Education; Harry K. Brown, chairman, Committee on Dental Public Health; Stanley J. Phillips, chairman, Finance, and Percy G. Anderson, chairman, Health Insurance Studies Committee.

Also Edward R. W. Bilkey, editor, *Journal of Canadian Dental Association*; Don W. Gullett, secretary, Canadian Dental Association; Mr. Ken L. Croft, deputy secretary and director, Bureau of Public Information, and Miss Isabel Boyd, assistant secretary and director, Bureau of Economic Research.

Representing the American Dental Association were: Paul H. Jeserich, president; Charles H. Patton, president-elect; Gordon L. Teall, second vice-president; Raymond L. Hart, third vice-president; Harold Hillenbrand, secretary; H. B. Washburn, treasurer; Lon W. Morrey, editor, THE JOURNAL OF THE AMERICAN DENTAL ASSOCIATION;

John R. Abel, Arthur W. Easton, John S. Eilar, William A. Garrett, Maynard K. Hine, E. Jeff Justis, Laurence L. Lathrop, Edward F. Mimmack, Obed H. Moen (ad interim), Paul K. Musselman, Fritz A. Pierson, Robert J. Wells and Henry M. Willets, members, Board of Trustees; H. S. Huxtable, chairman, Council on Dental Education; Floyd W. Pillars, chairman, Council on Legislation; J. Eugene Ziegler, chairman, Council on Dental Trade and Laboratory Relations; C. Willard Camalier, assistant secretary, Washington Office; Mr. Bernard J. Conway, assistant secretary, Legal Affairs; Shailer Peterson, assistant secretary, Educational Affairs; C. Gordon Watson, assistant secretary, Administrative Affairs; Mr. Bernard J. Beazley, secretary, Council on Dental Trade and Laboratory Relations; Mr. Hal Christensen, secretary, Council on Legislation; Mr. John Rush, business manager; Mr. Peter C. Goulding, director, Bureau of Public Information, and Miss Doris Nugent, assistant to the secretary.

SCIENCE FAIR WINNERS NAMED, TO EXHIBIT AT A.D.A. SESSION

The American Dental Association was headquarters host at the Health Awards Banquet May 12 at Indianapolis at which the National Science Fair finalists received awards.

The top Association citations were given to Sheila Marie Most, 15, Gulfport, Fla., an A.D.A. winner last year, for her "Study of Natural Fluoridation and Its Relation to the Paleo-Odontology of Two Prehistoric American Indian Tribes," and Donald Francis Kearney, 17, Warwick, R. I., for "Plastics vs. Metals." These winners will be given expense-paid trips to Los Angeles to exhibit their projects at the annual session of the Association in October.

Certificates of Meritorious Achievement and $50 gift certificates for scientific equipment were presented to Mary Sue Wilson, 16, Cedar Falls, Iowa, a top A.D.A. winner last year, for "Mutational Origin of Bacterial Resistance to Antibiotics" and to Alan Paul Bloebaum, 18, Austin, Texas, for "Effects of Sugars in Popular Carbonated Beverages on the Growth of *Lactobacillus acidophilus* in Saliva."

The American Medical Association, American Pharmaceutical Association and American Veterinary Medical Association, all co-sponsors of the National Science Fair, also made awards at the banquet.

Presentation of the American Dental Association awards was made by Maynard K. Hine, dean, School of Dentistry, Indiana University, who was master of ceremonies. Judges were Dr. Hine; Seymour J. Kreshover, associate director, National Institute of Dental Research, National Institutes of Health; George C. Paffenbarger, senior research associate at the American Dental Association's Research Division, National Bureau of Standards, and W. Wayne White, member of the Council on Dental Health, Missouri State Dental Association. Sholom Pearlman, secretary, Council on Dental Research of the Association, was recorder.

Paul H. Jeserich, Association president, and James M. Jones, president of the Indiana State Dental Association, were honor guests at the ceremonies.

Gory N. Casto, Jr.

ASSISTANT SECRETARYSHIP TO GORY N. CASTO, JR.

Gory N. Casto, Jr., Charleston, W. Va., has been appointed an assistant secretary of the Association. He will serve as secretary of the Council on Scientific Session and will be liaison to the Council on Constitution and Bylaws, the Bureau of Economic Research and Statistics, the Bureau of Library and Indexing Service and the Council on International Relations.

Dr. Casto, who will take up his new duties about the middle of June, has been secretary of the West Virginia State Dental Society since 1954. A graduate of the University of Louisville School of Dentistry in 1951, he has served as secretary and president of the Kanawha Valley (W. Va.) Dental Society, president of the Charleston Dental Study Club and a delegate to the American Dental Association House of Delegates. He also has been on the Membership Council of the Association and is a Fellow of the International College of Dentists. He served in the U. S. Army in 1945 and 1946.

Mr. Peter C. Goulding

GOULDING NEW DIRECTOR OF PUBLIC INFORMATION BUREAU

Mr. Peter C. Goulding, formerly secretary of the Council on International Relations and the Council on Scientific Session, became director of the Bureau of Public Information May 1.

Mr. Goulding was graduated from DePaul University and served in the Naval Air Corps during World War 2. He was a member of the staff of the Bureau of Public Information before becoming Council secretary. In 1958 he assumed the duties of secretary of the centennial staff committee for the Association's 100th annual session in 1959.

JESERICH APPOINTS TWO AS OFFICIAL REPRESENTATIVES

Association President Paul H. Jeserich has asked Obed H. Moen, chairman of the Council on International Relations,

to represent the Association at the annual conference of the British Dental Association July 11-15. The meeting will take place in Edinburgh.

Dr. Jeserich also designated Oren A. Oliver, Nashville, Tenn., as official delegate of the Association at the inauguration of Andrew David Holt as president of the University of Tennessee which took place May 14.

GROUP DENTAL CARE PLANS DISCUSSED AT CONFERENCE

The necessity for constituent societies to set up mechanisms for cooperation with and supervision of groups providing dental care emerged as a major consideration at the eleventh National Dental Health Conference held April 25-27 in Chicago by the Association's Council on Dental Health.

It was the opinion of the participants that group dental care plans will continue to increase and expand regardless of the absence of cooperation by dental societies. It was also emphasized that adequate dental care for the aged will become increasingly important.

Other topics under discussion were state dental public health activities, programs for improving diagnostic service, practice management and varieties of group practice, federal grants-in-aid and presentation of treatment plans to the patient.

The reports of the conferees will be published in THE JOURNAL in the near future. The Council on Dental Health held its annual meeting after the conference and will report its recommendations to the House of Delegates at the annual session in October in Los Angeles.

ALOYSE E. KOPP AD INTERIM NINTH DISTRICT TRUSTEE

Aloyse E. Kopp, Milwaukee, has been appointed by Association President Paul H. Jeserich as trustee for the Ninth District to succeed the late O. M. Dresen. Dr. Kopp will hold the ad interim appointment until the 1960 session of the House of Delegates when a successor will be elected for the remainder of the term expiring in 1962.

SCIENTIFIC SESSION COUNCIL PLANS FORUM ON PAIN CONTROL

One of the highlights of the one hundred and first annual scientific session in Los Angeles October 17-20 will be a forum on pain control.

The forum, to be moderated by Donald Mackay of St. Paul, will include an examination of pain, its etiology and elimination, together with an analysis of the benefits and dangers in the various pain-relieving technics. In the first session, Joseph Osterloh of San Francisco will discuss pain of dental origin—types, symptoms and etiological factors. Morgan Allison of the University of Ohio Dental College will speak on some important considerations in the performance of pain-free dentistry, and Harold J. Zubrow of Pittsburgh will talk on preoperative and postoperative management of pain.

Hypnosis—its clinical usefulness and psychological motivation will be discussed by Sidney Epstein of San Francisco in the second session. Pain control in dentistry for children will be the subject of a paper by Jerome L. Fechtner of Fanwood, N. J., and common errors resulting in inadequate anesthesia and complications will be covered by another speaker.

A symposium on new developments in dental roentgenology will be another feature of the scientific session. This will be moderated by T. S. Grant of Oakland, Calif., and the panelists will be Mr. John Kumpula, ADA research assistant at the National Bureau of Standards, Harrison M. Berry, Jr., of Philadelphia, and Robert M. Ricketts of Pacific Palisades, Calif.

Still another interesting feature of the program will be a panel discussion

of the problems associated with partial prosthodontics, moderated by John Johnston of Indianapolis. William McCracken, Birmingham, Ala., R. W. Dykema, Indianapolis, and Donald M. Cunningham, also of Indianapolis, will be the participants.

Dates and times of the forums, lectures and panel discussions will be listed in the August issue of THE JOURNAL which will contain the complete Preliminary Program.

Harry Lyons, dean, School of Dentistry, Medical College of Virginia, and past president of the American Dental Association, was awarded an honorary Doctor of Laws degree at the convocation ceremonies marking the dedication of the new dental school at the University of Manitoba. Dr. Lyons was the principal speaker in the formal ceremony held March 18 at the University in Winnipeg, Canada.

Dental Education

SEMINAR ON STUDY, PRACTICE OF ORAL MEDICINE AT MINN. U.

The University of Minnesota, School of Dentistry, and the Center for Continuation Study, announce the fifteenth annual seminar for the study and practice of oral medicine. Sessions will be held at the Continuation Center in Minneapolis September 23 and 24.

Further details can be obtained by writing to the Center for Continuation Study, University of Minnesota, Minneapolis 14.

BRONX HOSPITAL ACCEPTING INTERNSHIP APPLICATIONS

The Morrisania City Hospital, Bronx, N. Y., is accepting applications for an oral surgery internship to begin in July and run through June 1961. This program is accredited by the American Dental Association. The address of the hospital is 168th Street at Gerard Ave., Bronx 52.

VETERANS HOSPITAL IN NEW YORK HAS RESIDENCIES OPEN

The Veterans Administration Hospital of New York City is receiving applications for appointments as resident in periodontics or prosthodontics beginning July 1. The two-year programs in each specialty are approved by the Council on Dental Education of the American Dental Association, and fulfill the education requirements for Board Certification.

The starting annual stipend is $3,250. Further information can be obtained by writing to the chief of dental service at the hospital. The address is First Ave. at East 24th St.

DENTAL SCHOOLS ANNOUNCE PROGRAMS FOR SUMMER, FALL

Boston • The Department of Stomatology, Division of Graduate Studies, School of Medicine, Boston University, and the Massachusetts Memorial Hospitals announce the following courses for the beginning of the fall season:

Occlusal adjustment, September 12-16, Bernard S. Chaikin, Henry M. Goldman, Gerald M. Kramer, William Pendergast, Jack Bloom and associates; endodontics, September 12-16, Herbert Schilder.

Further information and application blanks can be obtained from the director of post-

graduate courses at the hospitals. The address is 750 Harrison Ave., Boston 18.

Iowa • Three June postgraduate courses are offered at the College of Dentistry, University of Iowa. They are: preventive orthodontics, June 6-9, Kenneth Wessels and staff, with Erik Telle of Norway as guest clinician; seminar in stomatology, June 6-9, faculty members, and management of the dentist's personal affairs, June 7-9, lawyers, business and investment authorities. The source of further information on these courses is William D. Coder, extension division, State University of Iowa, Iowa City.

Washington • A three-day course in management of advanced periodontal disease will be given August 4-6 by John F. Prichard, John I. Ingle and Saul Schluger, at the University of Washington School of Dentistry. Tuition is $75.

Dental Societies

DENTIST MADE PRESIDENT OF DEL. ACADEMY OF MEDICINE

George A. Zurkow, of Wilmington, Del., was elected president of the Delaware Academy of Medicine at its recent annual meeting. Dr. Zurkow is the eleventh president, and the first dentist to hold this office.

The Delaware Academy of Medicine was founded in 1930 and is an organization of physicians and dentists maintaining a well-equipped dental and medical library and meeting facilities with an auditorium seating 300 persons. In the building, which the Academy owns, the

Four of the American Dental Association's past presidents and the president-elect were present at the centennial meeting of the Kentucky Dental Association March 31-April 2 in Lexington. From left to right are Clyde Minges, Rocky Mount, N. C., who received a centennial award; LeRoy Ennis, Philadelphia; Harry Lyons, Richmond, Va.; Charles H. Patton, Philadelphia, president-elect of the A.D.A., and Oren Oliver, Nashville, Tenn. Dr. Patton was presented a Kentucky Colonel Commission by State Governor Bert Combs. Philip E. Blackerby, Battle Creek, Mich., also won a centennial award at the meeting, at which Julian M. Dismukes, Jr., of Paducah was installed as president.

At a recent meeting of the Arkansas State Dental Association, A. F. Schopper, left, and Paul Jeserich, right, speakers, observed Arkansas Governor Orval E. Faubus, center, formally appoint J. Lex Moore of Harrison to the State Board of Dental Examiners. Dr. Schopper is a former A.D.A. trustee, Sixth District, and Dr. Jeserich is president of the Association. Before his formal appointment by the Governor, Dr. Moore had been elected to the post by the Arkansas State Dental Association.

offices of the local dental and medical societies are located.

Last fall the Academy dedicated a new wing and Paul H. Jeserich, president of the American Dental Association, was one of the honor guests at the ceremony.

National Defense

ARMED FORCES DENTISTS CAN GET MALPRACTICE INSURANCE

In response to a request from the Association's Council on Insurance, M. A. Gesner, Inc., has made arrangements with the American Manufacturers Mutual Insurance Company to provide professional liability (malpractice) insurance coverage on Armed Forces dentists at extremely low rates.

This coverage can be obtained irrespective of where the officers may be stationed and will be underwritten on an individual basis in accordance with the following schedule of liability limits and premiums:

$5/$15,000	—	$10.00 annually
$10/$30,000	—	13.50 "
$15/$45,000	—	15.50 "
$25/$75,000	—	17.10 "
$50/$150,000	—	18.90 "
$100/$300,000	—	20.60 "

In view of the extraordinarily low rates, the Council recommends that the maximum limits be obtained in order to achieve optimum security.

Applications can be sent to M. A. Gesner, Inc., 99 John St., New York 38.

BERNIER TO SUCCEED EPPERLY AS ARMY DENTAL CHIEF

Col. Joseph L. Bernier, DC, United States Army, has been nominated by President Eisenhower for two-star rank as chief of the Army Dental Corps. He will succeed Maj. Gen. James M. Epperly who will retire July 30.

Colonel Bernier, chief, oral pathology branch, Armed Forces Institute of Pathology, for the past ten years, was graduated from the University of Illinois College of Dentistry in 1934. He was the first member of the Army Dental Corps to become a certified oral pathologist.

Colonel Bernier also is professor of oral pathology at Georgetown University, Washington, D. C.

SECOND NATIONAL CIVIL DEFENSE CONFERENCE OCT. 15

All members of the Association are eligible to attend the second National Dental Civil Defense Conference Saturday, October 15 in Los Angeles under the sponsorship of the Council on Federal Dental Services.

In addition to prominent speakers from government and the health professions, the conference program will include a condensed version of the Casualty Treatment Training Course presented by the Navy Dental Service.

Those wishing to attend are asked to register by notifying Mr. Herbert C. Lassiter, secretary, Council on Federal Dental Services, Central Office.

NAVY OFFERS NEW EXTENSION COURSE IN ORAL SURGERY

A new extension (correspondence) course in oral surgery, NAVPERS 10729, is now available to officers of the Dental Corps of the United States Navy and Naval Reserve.

Developed by the staff of the Naval Dental School, National Naval Medical Center, Bethesda, Md., with the assistance of professional test writers of the home study department of the University of Chicago, the course includes ten lessons, and the material includes a recent edition of a widely accepted oral surgery textbook.

Reserve dental officers may receive promotion and retirement points which are credited on successful completion of course units.

Applications for enrollment can be submitted on NAVPERS 992, Application for Enrollment in Officer Correspondence Course, via official channels to the Commanding Officer (Code 5), U. S. Naval Dental School, National Naval Medical Center, Bethesda 14.

ARMY TO CONDUCT COURSE IN MASS CASUALTY TREATMENT

Two spaces have been allocated to the Association for attendance by civilian members at the Medical Management of Mass Casualties Course to be conducted at the Walter Reed Army Institute of Research, Bethesda, Md., September 12-17.

Members interested in applying for the course are requested to notify Mr. Herbert C. Lassiter, secretary, Council on Federal Dental Services, American Dental Association, 222 E. Superior St., Chicago 11.

CASUALTY TREATMENT COURSES AT NAVY TRAINING CENTERS

The Navy Dental Service has announced that Casualty Treatment Training Courses will be presented at the United States Naval Dental Clinic in Norfolk, Va., July 25-29 and November 14-18. Similar courses have been scheduled for presentation at the Naval Training Center in San Diego, September 26-30 and October 31-November 4.

One space has been allocated to the Association for attendance by a civilian member at each of these courses. Any dentist interested in applying should contact Mr. Herbert C. Lassiter, secretary, Council on Federal Dental Services, at the Central Office.

Research

EXTRA P.H.S. FUNDS FOR DENTAL RESEARCH REQUESTED

The Senate Appropriations Subcommittee on Labor and Health, Education, and Welfare has scheduled hearings on fiscal 1961 appropriations for dental health activities of the Public Health Service. The American Dental Association has recommended that funds for dental research be increased five million dollars above the amount requested in the President's budget, or three and one-half million over the amount approved last month by the House.

Most of the increase recommended would be used to expand the programs for training dental students in the use of dental assistants. A series of recent studies

has indicated that dental services can be increased as much as 38 per cent by the efficient use of auxiliary personnel.

ORIGINAL RESEARCH PAPERS SOUGHT BY ORAL SURGEONS

Lloyd E. Church, chairman of the committee on research of the American Society of Oral Surgeons, has announced that members are being asked to contribute original research papers on any phase of oral surgery.

The committee will review all papers submitted, and the two judged of highest merit will be incorporated in the program for the forty-second annual meeting of the society October 12-15 in Phoenix, Ariz. In addition, a further award will be made as approved by the executive council.

The deadline for submission of papers is July 15. Dr. Church's address is 8218 Wisconsin Ave., Bethesda, Md.

Legislation

NEW YORK GOVERNOR SIGNS DENTAL INSURANCE PLAN BILL

A bill giving the New York State Dental Society authority to set up a statewide nonprofit health insurance plan for dental care was signed April 29 by Governor Rockefeller.

Last year the Governor vetoed a bill that would have enabled the society to set up a dental insurance plan on the ground that the bill did not provide for supervision of the plan by the State Insurance Department. The present bill includes such a requirement. Rates will be supervised by the Superintendent of Insurance.

The bill also allows two existing nonprofit dental health insurance plans to operate on a statewide basis. They are Group Health Dental Insurance and Dental Insurance Plan, both heretofore restricted to an 18-county area around New York City.

According to Charles A. Wilkie, secretary of the New York State Dental Society, its board of governors laid the groundwork for organizing the corporation at the state society's annual meeting May 8-11 in Buffalo.

LAB TECHNICIAN FINED $5,000, GIVEN ONE YEAR IN PRISON

A Joliet, Ill., dental technician, Mr. John Boyden, has been violating provisions of the Illinois Dental Practice Act over a period of years by taking impressions and making dentures directly for the public. On April 4, Circuit Court Judge James V. Bartley found him guilty of violating a 1955 injunction which perpetually enjoined and restrained him from practicing dentistry, taking impressions and making dentures for members of the public. Judge Bartley fined him $5,000 and sentenced him to a year in the prison at Vandalia.

The successful investigation and prosecution of Boyden resulted from the cooperative efforts of members of the Will-Grundy County Dental Society, local law enforcement officers, and the Law Enforcement Division of the Illinois State Dental Society.

International

MANY AMERICAN DENTISTS ON SWEDISH CENTENNIAL PROGRAM

The Centennial Congress of the Swedish Dental Society, in Stockholm August 17-20, is attracting many dentists from all over the world, as both participants and guests. Official delegates from the American Dental Association will be Paul H. Jeserich, president, Obed H. Moen,

chairman of the Council on International Relations and president of the Fédération Dentaire Internationale, and Harold Hillenbrand, secretary.

Lectures will be given in English throughout the Congress and certificates of participation will be given to all who take part in the discussions during the scientific sessions as well as those who lecture.

Among the speakers and members of symposiums from the United States listed on the preliminary program are Wallace D. Armstrong, Sigurd P. Ramfjord, Bernard Jankelson, Henry Goldman, Balint Orban, T. M. Graber, and Dr. Jeserich. Many others will have table clinics or show films.

The social program will include performances at the Drottningholm Palace Theatre, a ceremonial assembly at the Stockholm City Hall, sight-seeing trips in the city, and motor coach and boat trips in the surrounding countryside.

Reservations can be made through T. Telander, Nybrogatan 53, Stockholm, Sweden.

POLISH SOCIETY PLANS THIRD DENTAL CONGRESS IN WARSAW

The Polish Dental Association and the Organization Committee of the Third Polish Dental Congress announce that the meeting will be held September 23-25 in Warsaw. The theme of the congress will be periodontal disease.

Details regarding this meeting can be obtained by writing to A. Rokicka, secretary of the Polish Dental Association, Klinika Stomatologii Zachowawczej A. M., Warsaw 40, ul. Miodowa 18, Poland.

WORLD DENTAL MEETING NOV. 21-27 IN PARIS

Paris will be the scene of the thirty-fourth International Dental Meeting November 21-27 under the chairmanship of Professor Jean Bernard of the Faculty of Medicine of the University of Paris.

Simultaneous translation service will be provided for the lectures and demonstrations to be held in the Chemistry Building, 28, Rue Saint-Dominique. Table clinics will be held in reserved lecture rooms, and there will be an extensive technical exhibit.

Dentists from all countries are invited to attend. Registration can be made by writing to the secretary-general, Jean Boursier, 17, Rue du Colisee, Paris 8, France.

STOMATOLOGICAL CONGRESS IN CAGLIARI, ITALY, SEPT. 1-7

The thirty-fourth Congressor, Italiano di Stomatologia, sponsored by the Italian Dental Society, will be held September 1-7 at Cagliari, Sicily, Italy.

Two general subjects to be discussed during the scientific program are the dental industry of Italy and esthetics in dental prosthesis.

Members of the American Dental Association who may wish to participate in the program are asked to communicate with Harold Hillenbrand, secretary, at the Central Office, 222 East Superior St., Chicago 11.

DENTAL ASSOCIATION OF PERU NAMES BOARD OF DIRECTORS

The Dental Association of Peru, representative organization of Peruvian dentistry, has announced the following board of directors for 1960:

Secretary general, Oscar Serrudo V. de P.; secretary of the exterior, Oscar Blanco G.; secretary of the interior, J. L. Mogrovejo S.; secretary of culture, Jorge Díaz C.; secretary of economics, Joaquin Bernales; secretary of defense, Carlos Vento V.; secretary of public welfare, Luis James, and secretary of press and publicity, Luis Pazos Vélez.

SOUTH INDIA DENTISTS LACK DENTAL LIBRARY FACILITIES

The Association has received a communication from P. F. John, a dental surgeon of Alwaye, South India, in which he requests donations of dental literature to set up a dental library in the South India area. Dr. John states that there are no dental libraries in India, and that new books are extremely costly and used books scarcely available. He and his confreres practicing in the small towns and villages of India have many needy patients who are unable to pay for dental work, hence the incomes of the dentists are very low.

Used surgical instruments would be welcomed by these dentists also, according to Dr. John, but the great need is for a library to enable members of the profession there to keep up with modern developments in dentistry and enlarge the scope of their knowledge.

The Association's Bureau of Library and Indexing Service has dispatched a packet of 13 books and 8 pamphlets to Dr. John to serve as the nucleus of a dental library. It is hoped that dentists throughout the United States will donate used textbooks and journals on both dental and medical subjects to aid in this worthy cause. The group is particularly interested in books on endodontics, oral surgery and pathology, dental anesthesia, an atlas of oral surgery and anatomy, and textbooks on operative dentistry and prosthodontics.

Books and instruments can be sent to Fabians Dental Clinic, J. B. Road, Alwaye P. O., S. India, or directly to Dr. John at Market Road, Alwaye P. O., S. India.

ROBERTO CHARTIER PRESIDENT OF COSTA RICA SOCIETY

Announcement has been made of the following 1960 board of directors of the Society of Dental Surgeons of Costa Rica:

President, Roberto Chartier; secretary, Elizabeth Meza Páez; treasurer, Rolando Guzmán M.; auditor, Alvaro Castro Herrera; voting members, Eduardo Tamayo A., Adolfo Chen E. and Orlando Vargas Monge.

JAPAN FORMS SOCIETY FOR DENTAL CARIES PREVENTION

With the objective of combating the increase of dental caries in Japan, which has been rising rapidly since World War II, the Japan Society for Dental Caries Prevention recently has been established.

The purpose of the group is not to promote the traditional preventive measures such as oral hygiene, early diagnosis and preventive treatment as much as it is to further the adoption of new methods of prevention through the use of fluorine, both in water supplies and by topical treatment.

Chairman of the newly-formed society is T. Kono of the department of oral surgery, Faculty of Medicine, Tokyo University, and managing director is M. Murase, department of oral surgery, Tokyo Women's Medical College. Directors are F. Ninomiya, H. Fukada, M. Takeuchi, S. Matsumiya, T. Ueno, T. Niwa, T. Matsumura, Y. Yagyu and Y. Imagawa. G. Minoguchi is councilor.

CITY OF PARIS HONORS E. CHARLES GODON, DENTIST

E. Charles Godon, internationally known French dental surgeon and cofounder of the Dental School of Paris, the Odontological Society of France and the Fédération Dentaire Internationale, who died on May 20, 1923, was recently honored by the City Council of Paris. The council named the district in which he had resided and practiced, *Le Quartier Godon*.

Dr. Godon had served as secretary general of the First International Dental Congress, Paris, 1889; as vice-president of the World's Columbian Dental Congress,

Chicago, 1893; as honorary president of the Second French National Dental Congress, Nancy, 1896; as honorary president of the Third French National Dental Congress, Paris, 1897; as the author of the Plan of Organization of the Public School Dental Service of the City of Paris, 1886; as honorary president of the French National Dental Federation; as president and honorary president of the Fédération Dentaire Internationale, 1900 to 1913; as president of the Third International Dental Congress, Paris, 1900; as founder and president of the Odontological Section of the French Association for the Advancement of Science, and as vice-president of the Congress for School Hygiene.

Dr. Godon's articles and scientific works were numerous, and during World War I, the organization of the dental service of the French Armed Forces was his responsibility. In 1899, Godon became Chevalier of the Legion of Honor, and in 1912 he received the Miller Memorial prize from the meeting of the Fédération Dentaire International in Stockholm. Before he died, he was assistant mayor of the Eighth District of Paris, the district which now bears his name.

EAST GERMAN DENTISTS WIN HUFELAND PRIZE

On December 10, 1959, the government of the East German Democratic Republic awarded the Hufeland prize to 20 prominent scientists, among them 6 dentists, "for their outstanding contributions toward public health improvements." The dental winners of the coveted prize were: (1) Hellwig Amreihn, head of the Dental Clinic in Ludwigslust/Schwerin; (2) Z. Becker, industrial dentist, Erfurt/Thüringen; (3) Georg Einicke, industrial dentist, Oberlungwitz/Saxonia; (4) Gerhard Grottschreiber, dental practitioner, Neubrandenburg/Mecklenburg; (5) Albrecht Sack, head of the Dental Clinic in Grosschönau/Saxonia, and (6) Fritz Sautner, school dentist, Zittau/Saxonia.

HELLENIC A.R.P.A. RE-ELECTS O. LOURIDIS AS PRESIDENT

The General Assembly of the Hellenic A.R.P.A. at Athens, Greece, has re-elected Professor Oreste Louridis president. Other officers are: vice-president, M. Neamonitakis; secretary general, G. Peripopoulos; treasurer, G. Xynogalas, and councillors, B. Pezoulas, A. Apostolou, Ph. Johannidis, C. Liandjouras and M. Djordjopoulos.

These officers will serve for the 1960-63 period.

JOHN KOLLAR MADE HONORARY MEMBER OF PANAMA SOCIETY

John A. Kollar, Jr., Chicago, recently was made an honorary member of the Asociación Odontológica Panameña. Dr. Kollar presented a two-week seminar on periodontics and its relation to general practice in Panama, and also was a lecturer at the Third Congreso Dental Istmeño at which were present members of the Canal Zone Dental Society and the Asociación Odontológica Panameña.

General

B. W. WEINBERGER, 74, DIES; ORTHODONTIST, HISTORIAN

Bernhard Wolf Weinberger, 74, orthodontist and authority on dental history, died May 8 in New Orleans where he had lived in retirement from his dental practice in New York since 1958.

A graduate of the University of Pennsylvania dental school, Dr. Weinberger did graduate work at the Angle School of Orthodontia and was an early specialist in that field. He was a lecturer and professor of dental history and litera-

ture at the New York University College of Dentistry and a lecturer on orthodontic history at the University of Pennsylvania and the Baltimore College of Dental Surgery.

Dr. Weinberger was perhaps best known for two of the several books he authored, "Introduction to the History of Dentistry" and "Orthodontics." He also wrote a biography of Pierre Fauchard and was the author of many scientific papers and articles on dental history.

He was a Fellow of the American Association for the Advancement of Science and in 1930 founded the United States section of the International College of Dentists. He had been chairman of the committee on history of the American Dental Association and chairman of a similar committee of the Dental Society of the State of New York; former president of the New York Society of Dental History and Culture and a member of the Bibliographical Society of America and the American and New York Societies of Medical History.

ORAL PATHOLOGY WORKSHOP IN PORTLAND, ORE., JULY 10

Sheldon Jacobson, pathologist at the Veterans Administration Hospital at Vancouver, Wash., will moderate the Pacific Coast Oral Pathology Workshop July 10 at the Sheraton Hotel in Portland, Ore. The workshop is being held in conjunction with the Pacific Coast Dental Conference, and its subject will be intraosseous lesion of the jawbones. Dr. Jacobson has been active at the University of Oregon Medical Center for many years in establishing and continuing the activities of the bone tumor registry which has proved an excellent teaching and consultative agency.

Prior to the meeting each participant will be sent a set of duplicate roentgenograms, clinical photographs and clinical findings on each case, together with photomicrographs of the specific lesions.

Further information and applications for attendance can be obtained by writing to Norman H. Rickles, head, department of oral pathology, University of Oregon Dental School, 611 S. W. Campus Drive, Portland 1, Ore.

RESEARCH ASSOCIATE WRITES CHAPTER IN AAAS MONOGRAPH

Aaron S. Posner, Ph.D., a research associate of the American Dental Association, has contributed a chapter on "The Nature of the Inorganic Phase in Calcified Tissues" to a forthcoming monograph of the American Association for the Advancement of Science. The monograph, on "Calcification in Biological Systems," is under the editorship of Reidar Sognnaes, secretary of the AADS Section on Dentistry.

Dr. Posner reviews the literature on x-ray diffraction studies relating to calcified tissues. He concludes that the apatite portion of bone and tooth mineral probably consists of a calcium-deficient apatite containing other cations substituted for calcium ions. The carbonate in the hard tissue probably is submicroscopic calcite and magnesite admixed with, or adsorbed to, the major apatite phase.

PERIODONTISTS SPONSOR BERNARD GOTTLIEB PRIZE

An award of $500 along with a bronze plaque is given annually by the Northeastern Society of Periodontists for the most outstanding, original investigation submitted. The award is known as the Bernard Gottlieb Prize.

The contest is open to all investigators in the biologic and health sciences. Papers must be submitted in triplicate to the secretary of the society prior to January 1. The judges' decision will be forwarded to the secretary by the following March 1 and announced at the annual spring meeting of the society at which time the paper will be read. The winning paper

will be submitted to the *Journal of Periodontology* or other suitable journals for publication.

Secretary of the society is Irwin W. Scopp, Veterans Administration Hospital, First Avenue at East 24th Street, New York 10.

AUBREY L. MARTIN, 68, ORAL SURGEON, DIES IN SEATTLE

Aubrey Lee Martin, 68, a retired oral surgeon who had practiced dentistry 42 years, died suddenly April 13 at his home in Seattle.

Dr. Martin was a life member of the American Dental Association and the American Society of Oral Surgeons and a past president of the Seattle District Dental Society. He also was a founder of the Board of Oral Surgery. A veteran of World War I, he had specialized in oral surgery for 38 years.

ORAL BIOLOGISTS TO MEET OCT. 8-12 AT PALM SPRINGS

The seventeenth annual meeting of the American Institute of Oral Biologists will take place October 8-12 at Palm Springs, Calif., preceding the annual session of the American Dental Association at Los Angeles.

Listed among the speakers are Benjamin H. Ershoff, Ph.D., John Field, Ph.D., Edgar S. Gordon, M.D., Wilton M. Krogman, Ph.D., Balint Orban, C. M. Pomerat, M.D., Hamilton B. G. Robinson, and Milton J. Schiffrin, Ph.D.

Further information can be obtained from the office of the Institute at 2240 Channing Way, Berkeley 4, Calif.

ANESTHESIA GROUP SCHEDULES MEETING IN NEW YORK CITY

Milton S. Travin, Brooklyn, will speak at the fall meeting of the American Society for the Advancement of General Anesthesia in Dentistry, October 24 at the Hotel Shelburne, New York City. Dinner at 6:30 P.M. will precede the scientific session.

Dr. Travin will speak on the interpretation of sounds of respiration during general anesthesia.

Information pertaining to membership can be obtained from the executive secretary, M. Hillel Feldman, 730 Fifth Ave., New York 19.

PEDODONTISTS PLAN SEMINAR ON PRACTICAL DENTISTRY

Squaw Valley, Calif., will be the scene of the fifth annual Pedodontic Seminar sponsored by the Northern California unit of the American Society of Dentistry for Children, September 15-18.

The scientific session on practical dentistry will include lectures by John Tocchini on general anesthesia and operative dentistry, by Donald Zimmerman on practical pharmacy for use in the office, and panel discussions on tooth guidance and space maintenance by Irwin Beechen, Francis Rudine and Charles A. Sweet, Jr.

Reservations must be made by July 1 through the chairman, Robert A. Burley, 1402 Maria Lane, Walnut Creek, Calif.

AFRICAN TRIBE IS 'WAKAMBA'

A communication from C. D. Short, Nairobi, Kenya, informs us that the name of an African tribe which he described in his article "An instance of indigenous restorative dentistry in East Africa," appearing in the September 1959 issue of THE JOURNAL, is incorrectly spelled. The tribe referred to is known as the "Wakamba."

ACADEMY OF PERIODONTOLOGY PLANS PARLEY IN CALIF.

The Miramar Hotel, Santa Monica, Calif., will be the scene of the forty-sixth

Thomas Eldon Bowman, pictured at right, has been missing from his home in Pasadena, Calif., since March 1957 when he was eight years old. Police described him at that time as being four feet tall, weighing about 50 pounds, of slender build with blond hair and large brown eyes. His dental chart is shown. Any information concerning this child should be directed to C. H. Morris, Chief of Police, 142 North Arroyo Parkway, Pasadena.

annual meeting of the American Academy of Periodontology October 13-15. The theme of the scientific program of this meeting will be the role of the tooth in periodontal health and disease.

Any member of the American Dental Association or a foreign dental society may attend for a small fee.

Detailed information can be obtained from Howard A. Hartman, 4187 Pearl Road, Cleveland 9.

WORLD NUTRITIONISTS' PARLEY ON NEEDS AND RESOURCES

The fifth International Congress on Nutrition, to be held September 1-7 in Washington, D. C., will feature an all-day symposium on world food needs and food resources. Nutrition scientists from all over the world will participate.

The congress is being arranged under the auspices of the International Union of Nutritional Sciences, the American Institute of Nutrition and the U. S. National Committee, International Union of Nutritional Sciences of the National Academy of Sciences—National Research Council. Paul György, M.D., professor of pediatrics at the University of Pennsylvania, is chairman.

Simultaneous translation in four languages will be provided for the approximately 2,500 persons expected to attend.

Also • Dean Raymond J. Nagle, New York University College of Dentistry, was given the William Jarvie and Harvey J. Burkhart Memorial Award May 9 by the Dental Society of the State of New York at its annual meeting. . . . Robert J. Gorlin, professor and chairman, department of oral pathology, University of Minnesota School of Dentistry, has received a Fulbright Fellowship to work with Jens J. Pindborg at the Royal Dental College in Copenhagen, Denmark, starting in April 1961. . . . Earle S. Arnold, West Hartford, Conn., is the 1960 recipient of the Award of the Waterbury Dental Society. . . . Paul E. Boyle, dean, Western Reserve University School of Dentistry, has been reappointed to a full three-year term on the Surgeon General's Advisory Committee on the United States Health Survey. . . . Maxwell Karshan, professor emeritus of biochemistry at Columbia University, received the Alumni Research Award of the Association of Dental Alumni of Columbia for his long-term research on the biochemistry of dental disease. . . . Russell I. Todd, Richmond, Ky., has been appointed a regent of Eastern State College.

international correspondence

News from Great Britain

BRITISH DENTAL GUILD

In an editorial in the *British Dental Journal* information is given which may be of interest to readers of this letter about the British Dental Guild established by the members of the British Dental Association in 1956 as a body separate from the association but having as its main purpose the taking of such action as its Board of Managers may consider expedient to further or protect the interests of the dental profession or any section of the profession. The editorial goes on:

"To our grandfathers it would have seemed extraordinary that professional men should even contemplate the establishment of such an organization, but tremendous changes have taken place in the pattern of professional life since their days. We are faced with the difficulty of maintaining professional standards of altruism and independence in a world of increasing commercialism, while successive governments have striven to make us the servants of the state. Only a few years ago it would not have seemed possible that a member of a Royal Commission could write in a memorandum of dissent that 'Government Departments are therefore in the extraordinary, and perhaps unique, position that they largely control the demand for, the supply of, and the price offered for the services of the medical and dental professions.'

"This is the position as it is today, and it must be remembered that we are only at the beginning of the experiment in state-controlled medicine, now subservient to the state.

"The prospect of being slowly but surely engulfed by the state is not pleasant to those who believe in personal responsibility and personal freedom, but it proceeds slowly though remorselessly and if we do not keep constant watch another fetter is on us before we are aware of it.

"One individual is powerless, but a large number spurred by a common aim can do much. This is the reason for the Guild, and in establishing it dental surgeons are in the company not only of physicians and surgeons but of other professions as well. The basis of the Guild is self-interest, and self-interest in self-preservation is justifiable, but if in any way it helps to maintain a degree of independence of the profession then it will contribute to the even larger cause of maintaining personal freedom in general and fostering the acceptance of personal responsibility.

"As Government control clamps down more firmly, so will 'negotiation' and 'consultation' become more difficult for us, and so will these words change their significance as 'priority' has already done. The profession will have little to say in its own future unless it has an ultimate weapon, and the only one so far devised is the Guild. The value of the Guild will be determined by the support the profession gives it. Possibly, it may never be used however strong it becomes, but the need for it will undoubtedly increase. It should be strengthened today; our lamentations will be of no help tomorrow."

ROYAL COMMISSION ON DOCTORS' AND DENTISTS' REMUNERATION

The examination of the Commission's report by the respective committees of the British Dental Association has taken place and the first general conclusions are that it is clear that the general dental practitioner can expect no retroactive payment, and no immediate increase in the present scale of fees. As regards the future, there are many points in the report that are open to more than one

interpretation and the profession must ensure that it sends its best team of experienced and skilled negotiators down to the Ministry to argue over these many vital points of detail. When this is done they will speak with the voice of the majority of the profession, and it will be important that on all major points the profession shall be united. Although the report can hardly be a matter for rejoicing for general dental practitioners, their outlook for the future need not be an entirely pessimistic one if all are determined on a unanimous approach.

NATIONAL HEALTH SERVICE

W. G. Senior, Chief Dental Officer at the Ministry of Health, in an address to the annual conference of Local Dental Committees, pointed out that "the main problem of the profession seemed to be meeting the demand for dental care, and it was to be expected that the demand would increase. More people would seek treatment and more would become regular patients, and therefore more work would have to be done, even though in the course of time the amount required for each patient was diminished."

There had been a radical change, he said, in the age groups treated in the last ten years, from the older to the younger, and a further change might be expected to occur gradually. The adolescent made dentally fit in 1948, and maintained so subsequently, would soon be in the middle thirties, and instead of approaching "the denture age" would require progressively increasing periodontal treatment.

More dentists would be required, and undoubtedly more hygienists to undertake scaling and instruction in oral hygiene. In regard to hygienists, Dr. Senior reminded his audience that the British Dental Association had made strong representations for the reintroduction of the Ministry's training scheme, and said that after discussion with representatives of dental teaching hospitals the Ministry had agreed to finance training in small units of 5 up to a total of 40 a year.

"Orthodontic treatment is equally a problem to you as it is to us," he continued, and asked local dental committees to consider his suggestion that sufficient experience had been gained to warrant the inclusion in the scale of an orthodontic section from which it would be possible to estimate for this item as readily as for any other item of treatment. He referred to the change in the scientific approach to orthodontics over the last few years and pointed out how this had modified the concept of treatment.

ROYAL COLLEGE OF SURGEONS OF ENGLAND

Sir Zachary Cope has written a history of the College which is an important work of immediate value. For the first time there is available through the efforts of a learned, able and experienced medical historian a detailed and accurate history of the Royal College. It is however, far more than a history of this institution alone, since the author has not contented himself with a study of the minutes and other records of the College, but has read widely in contemporary medical and other journals in order to understand the historical background. Neither does the story begin in 1800 when the Company of Surgeons of London began, but as long ago as c. 1300, when the Company of Barbers (incorporated in 1462) began its existence.

The events leading to the establishment of the diploma of Licentiate in Dental Surgery are narrated in accurate detail, and there is much matter of importance to those interested in the specialty of dental surgery.

The institution of the Dental Faculty in 1947 and the enlargement of research facilities in the College are important stages in the development of the science of dental surgery in Great Britain, and the tremendous surge of activity in all departments which has taken place since about 1940, and is continuing, is given due consideration, so that the striking advance of the College from the position of an examining body with a magnificent museum and a fine library to an important postgraduate center and research institute (to quote the author) can be followed.

ITEMS OF INTEREST

British Dental Journal • Its many readers all over the world will want to congratulate the *British Dental Journal* on its eightieth birthday, for it first saw the light of day in March 1880.

Conference of Teachers • A very successful, and in its way unique, conference of teachers of conservative dentistry in Great Britain was held in London in April. The conference lasted two days and consisted of discussion, films, short papers, and a demonstration of television for teaching.

Memorial Service • A service expressing gratitude for the life and work of Lilian Lindsay was held in London in April, and to perpetuate the memory of this gracious and beloved lady who has done so much for the Brit-

ish Dental Profession, a Lilian Lindsay Commemoration Fund has come into being; the funds collected will be used within the British Dental Association Benevolent Fund.

Charles Tomes Lecture • Terence Ward will give this lecture entitled "Surgery of the Mandibular Joint" July 15 at the Royal College of Surgeons, London.

British Dental Association • The program for the annual conference to be held in Edinburgh July 11-15 is now published and contains a fine blending of scientific, administrative and social activities. Overseas visitors are always welcome at these annual conferences; Edinburgh should promise a particularly attractive background to a successful meeting.

G. H. Leatherman, D.M.D., F.D.S., R.C.S., F.A.C.D.

News from Brazil

IMPROVEMENTS IN DENTAL TEACHING

Sidney B. Finn, professor of pedodontics at the University of Alabama School of Dentistry, will present a six-week course on dentistry for children in July and August with attendance limited exclusively to the teaching personnel of Brazilian dental schools. His visit will be sponsored by the W. K. Kellogg Foundation, by CAPES (National Campaign for Improvement of University Personnel) and by ABENO (Brazilian Association of Dental Teaching).

Also planned by the same organizations is a course on operative dentistry for July-August 1961 on the same basis; that is, professors from the United States teaching only staff members of Brazilian dental schools; for mid-1962 a course on fixed partial prosthodontics, and for mid-1963 another on removable partial prosthodontics. The latter two courses probably will be held at the University of the State of Rio Grande do Sul, Pôrto Alegre, and the former at the National Faculty of Dentistry, University of Brazil, Rio de Janeiro. All courses will be repeated in January-February of the year following the original course, presented by Brazilian teachers who attended the original courses, for those members of the dental schools' staff who do not understand English.

ABENO's next meeting is scheduled for July 26-30 in the city of Diamantina, State of Minas Gerais. All 33 Brazilian dental schools will be represented. Among the subjects to be discussed are the curriculums and the libraries of the schools. Also to be heard is a report on the results of the statistical investigation of Brazilian dental schools begun in November 1959. This report will be published by the *Journal of the Brazilian Dental Association* as soon as it is available. Three professors from the University of São Paulo who are now organizing the data from the survey are Otávio Della Serra, Henrique Tastaldi and Guilherme Oswaldo Arbenz.

DENTAL CONVENTIONS

The city of Baurú, State of São Paulo, will hold its second dental meeting July 28-31. The program's main themes will be surgery, prosthodontics, operative dentistry and periodontics, and pedodontics and endodontics. Symposiums on the theme of the day will be held each evening. In charge of the meeting are José Simões Barroso, president; Paulo Amarante, scientific chairman; Nelson Leão, secretary, and Eurico Estevan, treasurer.

The resort city of Pocos de Caldas, State of Minas Gerais, will be host to the Second International Week of Endodontics dedicated to Mário Badan, August 7-13. Headquarters will be the Municipal Theater and the convention is expected to surpass in scope and size the highly successful First International Week of Endodontics held in the same city ten years ago.

Hans Freudenthal, C.D.

the reader comments

THE JOURNAL *devotes this section to comment by readers on topics of current interest to dentistry. The editor reserves the right to edit all communications to fit available space and requires that all letters be signed. At the request of the author, signatures will be deleted before publication. Printed communications do not necessarily reflect the opinion or official policy of the Association. Your participation in this section is invited.* *The Editor.*

NEED FOR MORE DENTISTS?

Dr. Hillenbrand of the American Dental Association collaborated on a report to the Department of Health, Education, and Welfare stating that 22 new dental schools and 2,700 additional dentists would be needed by 1975 in order to take care of expected dental needs in 1975.

I question this conclusion.

The basic assumption seems to be that all dentists in America are working to absolute capacity, therefore an increase in population means more dentists will be needed. This is an incorrect assumption. Right now in America a person can get any kind of dental work done easily providing only that he has the money for it or satisfactory credit. Many areas of America have an actual surplus of dentists who would be only too glad to have more patients per day, but there just aren't enough patients for all of the available dentists.

Any change leading to fewer dentists per population is desirable so that the already trained dentists set up in their offices might be able to work close to capacity by 1970. Setting up 22 new dental schools and increasing the production of dentists by 2,700 will only insure that dentists will have an even more difficult time getting enough patients to operate a dental office efficiently in the future.

Hope is held out that rising incomes and more education in America will automatically mean more patients and income for the dentists. That has not happened in the past and there is no reason to believe that it will happen in the future.

It continues to be a mystery to me why a representative of organized ethical dentistry would advocate a 50 per cent increase in dental schools and expanding the supply of dentists by 2,700 when many dentists today are not working anywhere near capacity. Isn't it only logical that attempts should be made to utilize the presently trained dentists before such an ambitious expansion program should be advocated?

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Minneapolis, Minnesota

NO DENTIST SHORTAGE

I could not help but read with interest the two letters in the March issue of *Dental Survey* relating to the supposed "shortage" of dentists. It seems to be an accepted fact that the only places where an actual shortage exists is in the extremely small and isolated towns that probably could not adequately support a dentist if one did move there. A visit to my office in this town of 150,000 would prove, as in the case of the Tennessee dentist, that there is not any shortage here.

I suppose a good bit of the cry is purely politics on the part of those who feel that they should get as much federal money for one thing or another as they can. I hope they have considered the federal control they are inviting and realize they are taking us one step closer to socialism in the medical and dental fields. I am sure that all of us are well aware of the rapid increase in population, but when one considers that only about 40 per cent of the population seeks dental care annually, I am sure that the mythical shortage disappears.

My solutions are only those that have been mentioned before; namely, to spend some of the money used in lobbying for more federal aid, to educate the public to the value and need of constant dental care and the benefits to be derived from fluoridation of public water supplies. Secondly, apply some of this same energy to bringing about reciprocity among the various states. This will not only allow relocation and help relieve the "shortage" in certain areas, but will permit the continued practice of those who must move for health or other imperative reasons.

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cases and comments

ACCIDENTAL SWALLOWING OF A DIAMOND INSTRUMENT

By Robert F. Eastman, D.D.S.,
New Orleans

In February 1959, a 49 year old woman patient accidentally swallowed a wheel-shaped diamond instrument. This happened during cavity preparation of a mandibular third molar by a dental student. The wheel part of the instrument was 6.5 mm. in diameter, the total length 18.5 mm., and the shank was tapered into a fairly sharp point.

The instrument had become loose in the contra-angle handpiece, dropped into the patient's throat and disappeared. It was believed the instrument had entered the esophagus since there was no cough reflex. The patient was informed of what had happened and advised to collect and examine her feces for the next several days to determine if the instrument had been eliminated from the alimentary canal.

After six days had elapsed, the patient reported she had not recovered the instrument. Roentgenographic examination revealed that the instrument had not been eliminated and was located in the cecum.

Subsequently a series of roentgenograms was made every two days, and little if any change in position of the instrument was observed from the sixth through the nineteenth day after the instrument had been swallowed. On the twenty-second day the patient came to the clinic with the instrument which had been recovered from the feces the night before.

Comment • This experience indicates that it may take quite a long time for a foreign object of this nature to be eliminated from the alimentary system.

Loyola University School of Dentistry

Fig. 1 • Diamond instrument accidentally swallowed by the patient

Fig. 2 • Roentgenogram showing the instrument lodged in the cecum

book reviews

WERKSTOFFKUNDE FÜR ZAHNÄRZTE (SCIENCE OF THE MATERIALS USED BY DENTISTS)

By Karl Falck. Third edition, revised by Paul Weikart. Index. 282 pages with 118 illustrations and 19 tables. DM 32. Munich, Carl Hanser, 1959.

Although the previous edition of this book was intended to serve as a textbook on dental materials for dental students, the revised third edition is a valuable reference book for dentists and dental technicians. Both the original author and Paul Weikart, a professor at the Dental Institute of the University of Cologne, who rewrote many chapters and revised others, emphasize that the book has been intended as a guidebook for the manipulation of dental materials in routine practice rather than as a scientific description of their properties.

The subject matter, according to German standards, is up to date and presented in an easily understood manner. The book is divided into two main chapters: (1) Dental Metals and Alloys, and (2) Nonmetallic Dental Materials. Each chapter, however, contains information on the general properties of the specific dental materials and the application of these properties to dental practice.

To the experienced dentist, the book presents an interesting discussion of the types of dental materials used in German dental practice, although certain procedures seem somewhat outdated considering the advances in technics and production achieved in the United States.

In general, the book is well written and excellently illustrated. Adequate references from the international literature and an extensive index conclude the book. Any dentist or student interested in the dental materials used in Germany will find this book of value.

Paul H. Glucksman

A HISTORY OF THE AMERICAN DENTAL ASSOCIATION: A CENTURY OF HEALTH SERVICE

By Robert W. McCluggage, Ph.D. 520 pages with 23 illustrations. Foreword, introduction and index. $8 (deluxe limited edition, $12.50). Chicago, American Dental Association, 1959.

In a most readable and well-documented volume, the author, who is in the Department of History at Loyola University, Chicago, has told the story of the growth of the American Dental Association. In 1859, dentistry was nothing resembling a science. Itinerant extractors of teeth journeyed the countryside, and the restoration or replacement of teeth was practiced but little. The physicians who were not above practicing a bit of dentistry on the side looked down on dentistry as a profession.

In an introduction, Richard H. Shryock emphasizes that dentistry in the United States early separated itself from medicine and grew as an independent profession, although for more than 100 years attempts have been made to integrate dentistry into the medical profession. Perhaps this may yet come about in the evolution of dentistry as a science; but as a profession to itself, dentistry surely has earned a unique place in the category of medical specialties.

As one reads this volume, the analogies with the growth of the American Medical Association become apparent. Equally apparent are the differences in the approach of dentistry to its special problems. More recently, the American Dental Association itself voted for the inclusion of dentists under Social Security (on a voluntary basis) whereas this still is a point of debate among physicians. Although dental literature never has reached the proportions of the literature of medicine, dentistry has become most respectable in the

quality of its publications and its ethical standards. Whereas the American Medical Association has abandoned its index of periodical literature and its Council on Pharmacy and Chemistry, the American Dental Association continues to publish a comprehensive *Index to Dental Literature*, and its Council on Dental Therapeutics continues to exercise a considerable influence in evaluating and disseminating information with regard to dental therapeutic and cosmetic agents. The campaign of the American Dental Association for fluoridation of water has become increasingly effective.

From small rented quarters in a Chicago loop building, the American Dental Association has grown to the stage where it occupies a large, modern central office in a six story building of its own.

A History of the American Dental Association gives food for thought to all who are interested in professional organizations, for this is a fine record of great accomplishment. The beautiful book is printed on a fine quality of paper, with good, clean type, adequate ornamentation with symbols and etchings, is fully annotated and has a comprehensive index.

The first 100 years have been fruitful; on the basis of this magnificent foundation, the next 100 years will sustain the dental profession as a science of service.

Morris Fishbein

TEXTBOOK OF ORAL SURGERY

Edited by Gustav O. Kruger, A.M., D.D.S. 573 pages with 489 illustrations. $12.75. St. Louis, C. V. Mosby Co., 1959.

In assembling and editing this book Dr. Kruger has drawn heavily upon contributors who are preeminent in the fields in which they write. In the preface Dr. Kruger states, "The contributors have been selected because of their competence in the field. Each has devoted his efforts to one chapter. It is to them that any credit for this work is due."

All of the 20 chapters are well written. The order of the subject matter is logical, straightforward and devoid of excess verbiage. The illustrations are well selected and add clarity to the text. The book is printed on excellent paper and well bound.

With the exception of exodontics, the entire field of oral surgery as carried out in the modern practice of this specialty is dealt with from both fundamental aspects and clinical practice. The exception of exodontics is probably quite proper in a book of this kind. The author states, "In most schools exodontia is taught as a separate course in the third year, and there are several books on this subject." For those schools which present the subject of oral surgery in this way, Dr. Kruger's book should be an excellent text. It seems that this book is well designed to meet the needs of the graduate student in oral surgery, and also those practitioners who feel competent to deal with most of the problems of exodontics but who would like authoritative and detailed information concerning other phases of oral surgery.

Warren R. Schram

BOOKS RECEIVED BUT NOT REVIEWED

READINGS IN MEDICAL CARE • Edited by the Committee on Medical Care Teaching of the Association of Teachers of Preventive Medicine. 708 pages with illustrations. $6.50. University of North Carolina Press, Chapel Hill, N. C., 1958.

PUBLIC ASSISTANCE MEDICAL CARE: AREAS OF NEEDED RESEARCH AND AN ANNOTATED BIBLIOGRAPHY • By S. J. Axelrod, M.D. 63 pages. $2. American Public Welfare Association, 1313 E. 60th St., Chicago 37, 1959.

TEACHING NUTRITION IN THE ELEMENTARY SCHOOL • By Mary Alice Banks and Margaret A. Dunham. 32 pages. 75c. American Association for Health, Physical Education and Recreation, 1201 16th St., N.W., Washington 6, D. C., 1959.

INTERPERSONAL RELATIONSHIPS IN THE HOSPITAL • Warner F. Bowers, M.D. 125 pages. $5. Charles C Thomas, 301-327 E. Lawrence Ave., Springfield, Ill., 1960.

TOWARD THE LIBERALLY EDUCATED EXECUTIVE • Edited by Robert A. Goldwin and Charles A. Nelson. 129 pages. The Fund for Adult Education, 200 Bloomingdale Rd., White Plains, N. Y., 1957.

EAT FAT AND GROW SLIM • By Richard Mackarness, M.B. 165 pages. $2.95. Doubleday & Company, Inc., 575 Madison Ave., N. Y. 22, 1959.

"H_3" IN THE BATTLE AGAINST OLD AGE: A DRAMATIC NEW USE FOR NOVOCAINE? • By Henry Marx. 207 pages with illustrations. $4.95. Plenum Press, Inc., 227 W. 17th St., New York 11, 1960.

deaths

BUREAU OF MEMBERSHIP RECORDS

Greenhood, Julia C., Boston; George Washington University Dental Department, 1919; died November 9; age 74.

Headen, Leon W., Chicago; Northwestern University Dental School, 1924; died December 3; age 64.

Heffernan, Andrew J., Wilkes-Barre, Pa.; Temple University School of Dentistry, 1907; died November 17; age 78.

Heil, Roy H., Topeka, Kan.; University of Pittsburgh School of Dentistry, 1916; died October 19; age 71.

Hession, John F., Berkeley Heights, N. J.; New York University College of Dentistry, 1956; died December 7; age 29.

Heyne, Ernest L., Chicago; St. Louis Dental College, 1905; died September 3; age 75.

Hillis, Harry H., St. Louis, Mo.; Western Dental College, 1904; died November 9; age 76.

Jackson, Virgil T., New Orleans; Barnes Dental College, 1912; died November 10; age 71.

Jacobs, Anthony W., Chicago; Loyola University School of Dentistry, Chicago College of Dental Surgery, 1931; died December 17; age 53.

Kraemer, Andrew J., Blue Rapids, Kan.; Chicago College of Dental Surgery, 1919; died December 3; age 65.

Large, Stanley H., Imlay City, Mich.; Detroit College of Medicine, Department of Dental Surgery, 1896; died January 4; age 86.

Laurence, Charles H., Ruston, La.; Atlanta Dental College, 1897; died October 25; age 89.

Levy, Samuel J., New York; College of Dental and Oral Surgery, 1915; died December 3; age 76.

Lipschutz, Albert L., Philadelphia; Temple University School of Dentistry, 1936; died November 20; age 46.

Logwood, Burt E., New Bedford, Mass.; Tufts College Dental School, 1903; died March 18; age 88.

Luntz, Frank, Middletown, Conn.; University of Pennsylvania School of Dentistry, 1922; died November 30; age 59.

Mach, Milton M., Omaha, Neb.; Creighton University School of Dentistry, 1910; died November; age 75.

Martin, Robert L., Eagle Grove, Iowa; Drake University College of Dentistry, 1910; died September 24; age 72.

Mault, Edward C., Titusville, Pa.; University of Pittsburgh School of Dentistry, 1917; died November 11; age 66.

McCluskey, Floyd M., Glenwood, Iowa; Northwestern University Dental School, 1901; died September 5; age 81.

McKevitt, Frank H., San Francisco; College of Physicians and Surgeons, 1910; died November 22; age 79.

Melnick, Harold H., Miami Beach, Fla.; New York College of Dentistry, 1915; died October 20; age 69.

Melton, Lora T., Marshfield, Mo.; Kansas City Dental College, 1917; died June 22; age 67.

Meuser, Ernest A., Brandon, Vt.; Harvard Dental School, 1939; died December 9; age 44.

Middlecoff, Charnell W., Memphis, Tenn.; University of Tennessee College of Dentistry, 1923; died January 9; age 70.

Milutis, Joseph A., Easton, Pa.; University of Pittsburgh School of Dentistry, 1936; died November 15; age 48.

Moore, Harry W., Oakland, Calif.; College of Physicians and Surgeons, 1905; died January 4; age 74.

Moores, Madison W., Daytona Beach, Fla.; Vanderbilt University School of Dentistry, 1906; died November 30; age 78.

Moreland, Howard W., Groves, Texas; St. Louis Dental College, 1907; died December 17; age 73.

Morgan, Rufus K., Allentown, Pa.; University of Pennsylvania School of Dentistry, 1905; died November 16; age 84.

Moriarty, Herman O., Whiting, Ind.; Indiana University School of Dentistry, 1925; died October 25; age 59.

Morimoto, Isamy S., Kansas City, Mo.; University of Kansas City School of Dentistry, 1953; died December 7; age 36.

Morin, Elnora B., Babylon, N. Y.; Pennsylvania College of Dental Surgery, 1906; died April 14; age 90.

Morton, Frederick D., Washington, D.C.; Howard University College of Dentistry, 1923; died December 29; age 76.

Moulder, Earl Y., Buffalo, Mo.; Kansas City-Western Dental College, 1929; died October 19; age 56.

Neulander, Ignatius, Flushing, N. Y.; University of Maryland, Dental Department, 1918; died October 17; age 64.

Newell, Carl A., Junction City, Kan.; Creighton University School of Dentistry, 1912; died December 15; age 78.

Nichols, Raymond E., Detroit; University of Michigan School of Dentistry, 1915; died November 21; age 66.

O'Brien, Lionel C., Sappington, Mo.; Washington University School of Dentistry, 1933; died December 24; age 50.

Ohtness, Sigurd H., Chicago; Northwestern University Dental School, 1909; died January 14; age 72.

Okun, Bernard, Great Neck, N. Y.; New York College of Dentistry, 1916; died September 23; age 71.

Oldham, Arthur J., Wellesley, Mass.; Harvard Dental School, 1890; died April 4; age 91.

O'Neill, James F., St. Louis; St. Louis University School of Dentistry, 1923; died December 6; age 65.

Ordonez, Fernando J., San Juan, Puerto Rico; Medical College of Virginia School of Dentistry, 1924; died November; age 65.

Packard, Edwin S., Los Angeles; University of Southern California School of Dentistry, 1918; died November 21; age 65.

Patterson, William A., Philadelphia; University of Pittsburgh School of Dentistry, 1914; died December 7; age 73.

Pelosi, Michael H., Philadelphia; Temple University School of Dentistry, 1919; died January 10; age 71.

Perry, Fred E., Oakland, Calif.; Howard University College of Dentistry, 1946; died November 11; age 34.

Peterson, Palmer L., Eau Claire, Wis.; University of Minnesota School of Dentistry, 1916; died October 18; age 67.

Pink, Louis, Garfield, N. J.; University of Pennsylvania School of Dentistry, 1927; died January 17; age 55.

Pollo, Efren M., New York; Howard University College of Dentistry, 1956; died January 6; age 36.

Pyott, James E., Baltimore; Baltimore College of Dental Surgery, University of Maryland, 1926; died December 25; age 62.

Quinn, Francis X., New York; Tufts College Dental School, 1903; died December 24; age 78.

Rathbun, Harry A., St. Louis, Mo.; Marion-Sims College of Medicine Dental Department, 1898; died October 14; age 88.

Reinhardt, Dale H., Scottsbluff, Neb.; University of Nebraska College of Dentistry, 1919; died December 26; age 64.

Richards, Chester W., Cleveland Heights, Ohio; Western Reserve University School of Dentistry, 1912; died October 1; age 88.

Ritter, James L., Brooklyn; New York University College of Dentistry, 1926; died December 11; age 58.

Robinson, Alfred T., New York; Howard University College of Dentistry, 1905; died April; age 85.

Rogers, William J., Cortez, Colo.; University of Illinois College of Dentistry, 1906; died November 3; age 75.

Romero, John J., St. Louis; St. Louis University School of Dentistry, 1923; died November 20; age 61.

Rosenzweig, John, White Plains, N. Y.; New York College of Dentistry, 1914; died November 6.

Roth, Lee A., Elmira, N. Y.; University of Buffalo School of Dentistry, 1910; died November 28; age 74.

Rothenberg, Zucio A., Brighton, Mass.; died May 21; age 76.

Ryan, William E., Gig Harbor, Wash.; University of Washington School of Dentistry, 1957; died December 20; age 27.

Ryll, John D., Elmira, N. Y.; Loyola University School of Dentistry, Chicago College of Dental Surgery, 1926; died December 23; age 68.

Saphirstein, Henry, Boston; Tufts College Dental School, 1923; died November 4; age 57.

Sausser, Emerson P., Philadelphia; University of Pennsylvania School of Dentistry, 1903; died December 6; age 78.

Savage, William F., Clifton Forge, Va.; Georgetown University School of Dentistry, 1917; died November 15; age 63.

Schleiter, John, LaCrosse, Wis.; Chicago College of Dental Surgery, 1900; died January 5; age 86.

Schulz, Robert E., Greensburg, Kan.; Western Dental College, 1917; died November 26; age 67.

Scobie, David A., Ogdensburg, N. Y.; Philadelphia Dental College, 1892; died November 14; age 90.

Seal, Shelby A., Temple City, Calif.; died December; age 87.

Seavey, Ralph A., Winslow, Wash.; University of Minnesota School of Dentistry, 1913; died November 24; age 78.

Seman, John J., Shaker Heights, Ohio; Indiana University School of Dentistry, 1929; died December 23; age 67.

Sexton, Clement G., Mauston, Wis.; Marquette University Dental School, 1924; died August 11; age 62.

Shain, Clarence L., Chicago; Northwestern University Dental School, 1913; died January 24; age 69.

Shanahan, Daniel F., Waterbury, Conn.; Georgetown University School of Dentistry, 1924; died January 3; age 58.

Shapiro, Isadore H., Chicago; Loyola University School of Dentistry, Chicago College of Dental Surgery, 1924; died November 27; age 61.

Shapiro, Walter I., Brooklyn; New York College of Dentistry, 1918; died October 10; age 68.

Sharon, Arthur L. V., Worcester, Mass.; University of Pennsylvania School of Dentistry, 1908; died December 24; age 72.

Shaw, Samuel, New York; New York College of Dentistry, 1913; died November 16; age 69.

Sheinberg, Samuel, New York; New York College of Dentistry, 1913; died November 16.

Sherard, Wade H., Anderson, S. C.; Atlanta Dental College, 1905; died December 26; age 82.

Sherman, Elmer T., Wilbraham, Mass.; Pennsylvania College of Dental Surgery, 1896; died October 4; age 93.

Sherman, Frank R., Sherman Oaks, Calif.; University of Pennsylvania School of Dentistry, 1930; died December 8; age 51.

Sherman, Sol, Brooklyn; New York College of Dentistry, 1913; died October 26; age 65.

Shields, George M., Miami, Fla.; Atlanta-Southern Dental College, 1923; died November 30; age 64.

Shinn, Don A., Billings, Mont.; Chicago College of Dental Surgery, 1907; died November 23; age 74.

Showalter, Samuel C., Quakertown, Pa.; Temple University School of Dentistry, 1937; died November 9; age 46.

Siess, Harry J., Shreveport, La.; New Orleans Dental College, 1902; died October 9; age 77.

Simon, Ben S., Springfield, N. J.; University of Michigan School of Dentistry, 1930; died November 8; age 55.

Singleton, Lewis G., Bowling Green, Ky.; Louisville College of Dentistry, 1905; died October 2; age 78.

Skinner, Chester G., Alhambra, Calif.; Philadelphia Dental College, 1898; died January 20; age 85.

Skowyra, Frank S., Chicopee, Mass.; Loyola University School of Dentistry, Chicago, College of Dental Surgery, 1958; died January 12; age 32.

Slack, Fred A., Bala-Cynwyd, Pa.; Philadelphia Dental College, 1901; died November 22; age 85.

Smith, Charles T., Little Rock, Ark.; Vanderbilt University School of Dentistry, 1914; died December 17; age 68.

Smith, Homer A., Worcester, Mass.; Northwestern University Dental School, 1911; died January 7; age 73.

Smith, Mortimer F., Rowland, N. C.; Atlanta-Southern Dental College, 1927; died December 2; age 56.

Sorsen, Oscar H., Laurium, Mich.; Chicago College of Dental Surgery, 1901; died November 12; age 87.

Southwick, Raymond F., Sodus, N. Y.; University of Buffalo School of Dentistry, 1903; died December 28; age 77.

Spear, Lewis B., Indianapolis; Indiana Dental College, 1917; died August 23; age 71.

Spitler, Daniel K., South Bend, Ind.; Indiana Dental College, 1907; died November 29; age 78.

Stanislaw, Paul, New York; New York College of Dentistry, 1918; died January 14; age 62.

Staples, Edward J., Dorchester, Mass.; Tufts College Dental School, 1915; died September 26; age 70.

Starry, Thomas E., Madison, Wis.; Northwestern University Dental School, 1908; died September 29; age 76.

Steinmesch, Garrett L., Bedford, Mo.; St. Louis Dental College, 1904; died September 18; age 79.

Steuer, William H., Hastings-on Hudson, N. Y.; College of Dental and Oral Surgery, 1916; died January 19; age 65.

Stevens, Ray E., Grand Rapids, Mich.; University of Michigan School of Dentistry, 1917; died September 29; age 66.

Stitt, Charles S., Steubenville, Ohio; University of Pittsburgh School of Dentistry, 1918; died October 19; age 62.

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LON W. MORREY, *Editor* JOHN E. RUSH, *Business Manager*

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Advertising copy must conform to the official standards established by the American Dental Association. Advertising forms close the 20th of the second month preceding issue. Rates and other information pertaining to advertising should be addressed to: John J. Hollister, director of Advertising and Exhibits. Notice of change of address should be received one month before the change is to be effective. Orders for reprints of Journal articles must be received by the Business Manager's office not later than the 15th of the month of issue in order to secure advantage of the lowest possible prices. Orders received after this date are subject to special quotation.

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Kolynos has therefore developed a new Super-White formula that's a highly effective combination for brushing. It has 3 cleansing agents instead of 2. Brushing with this additional cleansing action effectively removes food residues that lead to cavities ...gives naturally whiter, brighter teeth. *No toothpaste anywhere can do more.* Yet Kolynos costs *less* than other leading brands. 2 giant tubes for only 69¢.

announcements

MEETINGS OF THE AMERICAN DENTAL ASSOCIATION

One-Hundred and First Annual Session	October 17-20, 1960	Los Angeles
One-Hundred and Second Annual Session	October 16-19, 1961	Philadelphia
One-Hundred and Third Annual Session	October 29-November 1, 1962	Miami Beach, Fla
One-Hundred and Fourth Annual Session	October 14-17, 1963	Atlantic City, N.J.
One-Hundred and Fifth Annual Session	November 9-12, 1964	San Francisco

MEETINGS OF CONSTITUENT SOCIETIES

State	*Date*	*Place*	*Secretary and Address*
Alabama	Apr. 24-26	Mobile	C. R. Crook, Professional Center, Montgomery
Alaska	July 5-7	Juneau	W. E. Alexander, 406 G St., Anchorage
Arizona			W. G. Burke, 2727 N. Central Ave., Phoenix
Arkansas	Apr. 9-12	Little Rock	D. M. Hamm, Box 89, Clarksville
California	Apr. 16-19	San Francisco	W. J. Healy, 518 Sutter St., San Francisco 8
S. California			J. H. Thomason, 903 Crenshaw Blvd., Los Angeles 19
Colorado	Oct. 2-5	Colorado Springs	G. H. Siersma, 724 Republic Bldg., Denver 2
Connecticut			E. S. Arnold, 37 Linnard Rd., W. Hartford
Delaware	June 3, 4	Wilmington	E. J. Truono, 1401 Gilpin Ave., Wilmington 6
Dist. of Columbia	Mar. 12-15	Washington	J. F. Keaveny, 1835 Eye St., N.W., Washington 6
Florida			R. Chace, 518 Tampa St., Tampa
Georgia	Oct. 2-5	Savannah	F. M. Butler, Jr., 701 Southern United Bldg., Macon
Hawaii	Oct. 24-27	Honolulu	J. H. Dawe, 291 Alexander Young Bldg., Honolulu 13
Idaho	Sept. 15-17	Sun Valley	H. E. Burgess, 151 Fourth Ave., N., Twin Falls
Illinois			P. W. Clopper, 632 Jefferson Bldg., Peoria
Indiana			C. L. Howell, 1012 Hume Mansur Bldg., Indianapolis 4
Iowa	May 1-3	Des Moines	H. N. Hake, 639 Insurance Exchange Bldg., Des Moines 9
Kansas			F. A. Richmond, Brotherhood Bldg., Kansas City 1
Kentucky	Apr. 9-12	Louisville	A. B. Coxwell, Jr., 2208 Dundee Rd., Louisville 5
Louisiana	May 5-7	Lafayette	J. S. Bernhard, 231 Atkins Ave., Shreveport 26
Maine	June 16-18	Rockland	S. M. Gower, 6 Coburn Ave., Skowhegan
Maryland	June 8-12	Atlantic City	W. Schunick, 19 Medical Arts Bldg., Baltimore 1
Massachusetts			H. E. Tingley, 227 Commonwealth Ave., Boston
Michigan			F. Wertheimer, Michigan Dept. of Health, Lansing
Minnesota	Apr. 17-19	Minneapolis	C. V. E. Cassel, 2236 Marshall Ave., St. Paul 4W

Progress Report from [redacted]

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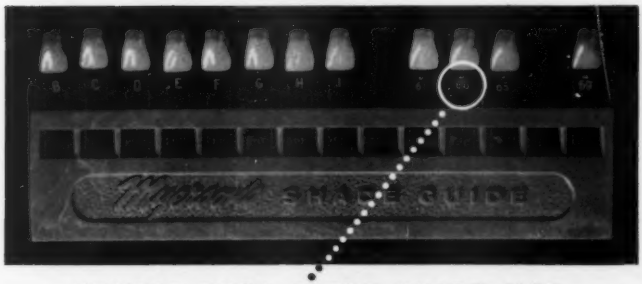

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Mississippi			M. C. O'Keefe, Medical Arts Bldg., Jackson 2
Missouri			E. D. Suggett, Merchants Bank Bldg., Jefferson City
Montana			R. C. Ritter, 1236 N. 28th St., Billings
Nebraska	Apr. 24-26	Lincoln	F. A. Pierson, Federal Securities Bldg., Lincoln
Nevada	June 12-14	Elko	O. M. Seifert, 821 Ryland Ave., Reno
New Hampshire	June 12-15	Whitefield	F. E. Williams, 517 Manchester St., Manchester
New Jersey	May 14-18	Atlantic City	J. G. Carr, 407 Cooper St., Camden
New Mexico			W. A. Blueher, 113A Girard St., S.E., Albuquerque
New York			C. A. Wilkie, 268 Ashland Pl., Brooklyn 17
North Carolina			S. B. Towler, P.O. Box 11065, Raleigh
North Dakota	Sept. 11-13	Williston	D. R. Perry, Box 866, Bismarck
Ohio	Nov. 13-16	Columbus	E. G. Jones, 185 E. State St., Columbus
Oklahoma			L. D. Wright, 210 Plaza Court Bldg., Oklahoma City
Oregon	Mar. 6-8	Portland	T. D. Holder, Selling Bldg., Portland
Panama C. Z.			G. E. Lilly, Box 29, Ft. Clayton
Pennsylvania			I. Sissman, 217 State St., Harrisburg
Puerto Rico			R. Gonzalez R., Box 10452, Caparra Heights
Rhode Island	Jan. 17, 18	Providence	E. M. Nelson, 901 Union Trust Bldg., Providence
South Carolina			J. E. Wallace, 1506 Gregg St., Columbia
South Dakota			R. E. Decker, Box 308, Parker
Tennessee			K. P. Ezell, 119 Louise Ave., Nashville 5
Texas	Apr. 30-May 3	Houston	C. A. McMurray, 3707 Gaston Ave., Dallas 10
Utah	May 18-20	Salt Lake City	R. C. Dalgleish, 1554 Princeton Ave., Salt Lake City
Vermont	June 24-26	Vergennes	E. C. Woods, 128 Merchants Row, Rutland
Virginia	Apr. 30-May 3	Roanoke	M. E. Henderson, Shenandoah Bldg., Roanoke 11
Washington			D. R. Shaw, 417 Grosvenor House, 500 Wall St., Seattle 1
West Virginia	July 17-20	White Sulphur Springs	G. N. Casto, Jr., P.O. Box 1946, Charleston
Wisconsin			C. J. Baumann, Jr., 704 W. Wisconsin Ave., Milwaukee
Wyoming	June 16-18	Jackson	T. J. Drew, State Office Bldg., Cheyenne

MEETINGS OF STATE BOARDS OF DENTAL EXAMINERS

State	Date	Place	Secretary and Address
Alabama	June 19-25* June 20†	Birmingham	W. L. Smith, 524 Chestnut St., Gadsden
Alaska	July 19-22	Anchorage	E. I. Baggen, Box 1394, Fairbanks
Arizona	June 19-30	Florence	W. G. Biddulph, 1611 N. Second Ave., Glendale
Arkansas	June 19-25	Little Rock	G. Cone, 113 S. Pecan St., Osceola
California	June 19-25‡ July 25-29‡		T. R. Flinn, 1021 O St., Rm. A-597, Sacramento 14
Colorado	June 19-25	Denver	B. DeRose, Republic Bldg., Denver 2
Connecticut	June 19-23* June 22, 23†	Bridgeport	M. J. Zazzaro, 99 Pratt St., Hartford 3
Delaware	June 20 June 21-23	Philadelphia Wilmington	J. F. Maguire, 1200 N. Van Buren St., Wilmington
Dist. of Columbia	June 13-17	Washington	J. A. Madden, 1740 Massachusetts Ave., N.W., Washington 11
Florida	July 3-14* July 3, 4†	Jacksonville	R. P. Taylor, Jr., P.O. Box 2913, Jacksonville 3
Georgia			H. M. Robertson, 206 Donehoo St., Statesboro
Hawaii	Sept. 1-4‡		F. S. Kagihara, 1644 S. King St., Honolulu
Idaho	June 20-23*†‡		W. M. Smith, 305 Fort St., Boise
Illinois			R. I. Humphrey, 185 N. Wabash Ave., Chicago
Indiana	June 7-10*†	Indianapolis	C. A. Frech, Gary National Bank Bldg., Gary

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State	*Date*	*Place*	*Secretary and Address*
Iowa	June 6-10*†	Iowa City	P. A. Hahn, Farmers & Merchants Bank Bldg., Burlington
Kansas	June 9-11*†	Kansas City	R. C. Windscheffel, Medical Arts Bldg., Smith Center
Kentucky	June 6-9*†	Louisville	J. J. Kelly, 102 W. Madison St., Franklin
Louisiana			A. R. deNux, 617 N. Monroe St., Marksville
Maine	June 20-22*†	Boston	A. H. Garcelon, 133 State St., Augusta
Maryland	June 6-8*†‡		F. J. Bryce, 303 Granville Dr., Silver Spring
Massachusetts	June 6-10*†‡		Maurice E. Sullivan, 33 State House, Boston
Michigan	June 5-11	Ann Arbor	J. L. Champagne, 3714 W. McNichols Rd., Detroit 21
Minnesota	June 13-17* June 13, 14†	Minneapolis	E. A. Nelson, 2236 Marshall Ave., St. Paul 4W
Mississippi	June 27-29*†	Jackson	A. H. Richter, Jr., Aven Bldg., Greenwood
Missouri	June 6-8, 13, 14* Kansas City June 9-11, 13, 14* St. Louis		R. R. Rhoades, Central Trust Bldg., Jefferson City
Montana	July 11-14*†	Helena	E. A. Cogley, Medical Arts Bldg., Great Falls
Nebraska	June 2-9	Lincoln	H. E. Weber, Stuart Bldg., Lincoln
Nevada	June 14	Reno	R. Whitehead, 40 W. First St., Reno
New Hampshire	June 16, 17* June 16†	Boston	L. U. Bergeron, 211 High St., Somersworth
New Jersey	June 2, 3*† June 6, 7*† June 13, 14* June 16, 17*† June 20, 21*†	New York Philadelphia Trenton Philadelphia Teaneck	C. J. Schweikhardt, 150 E. State St., Trenton
New Mexico	June 20-25*†‡		G. D. Hastain, Box 1007, Clovis
New York	June 23, 24*	New York Buffalo	D. F. Wallace, 23 S. Pearl St., Albany 7
	June 28-July 1*	New York Albany Syracuse Buffalo Rochester	
North Carolina	July 27*†	Chapel Hill	J. H. Guion, Doctors Bldg., Charlotte 7
North Dakota	July 11-15	Fargo	F. A. Maides, First National Bank Bldg., Grand Forks
Ohio	June 6-11* June 11† June 13, 14*† June 16-18*	Columbus Columbus Columbus Cleveland	D. E. Bowers, 322 E. State St., Columbus 15
Oklahoma	June 20-22* June 20, 22†	Oklahoma City	W. H. Stephens, Plaza Court Bldg., Oklahoma City
Oregon	June 6-9*†	Portland	F. L. Utter, Pioneer Trust Bldg., Salem
Pennsylvania	June 1, 2* June 1† June 1* June 22, 23* June 22†	Philadelphia Philadelphia Pittsburgh Philadelphia Philadelphia	P. Swanson, 8111 Jenkins Arcade, Pittsburgh
Puerto Rico			J. Mercado C., Comercio St., #425, San Juan
Rhode Island			F. M. Hackett, 267 Academy Ave., Providence
South Carolina	June 16-18	Columbia	W. J. Brockington, 1508 Washington St., Columbia 1
South Dakota	June 19-22*†	Sioux Falls	H. T. Aker, Canton
Tennessee	June 13-17*†	Memphis	C. R. Aita, Bennie-Dillon Bldg., Nashville
Texas	June 5-11* June 5-7†	Dallas	R. T. Weber, Capital National Bank Bldg., Austin 16
Utah	June 20-24‡		H. R. Nordberg, 143 S. Main St., Salt Lake City 1
Vermont	June 27-29*†	Burlington	P. M. Fitch, Newport
Virginia	June 13-18* June 15, 16†	Richmond	J. M. Hughes, Medical Arts Bldg., Richmond
Washington			T. W. James, 1612 Hewitt Ave., Everett
West Virginia	June 20-22* June 23†	Morgantown West Liberty	A. B. Drake, 1355 Fourth Ave., Huntington
Wisconsin	June 6-10*†	Milwaukee	S. F. Donovan, Tomah
Wyoming	June 20-23*†	Rawlins	W. J. Ryan, Boyd Bldg., Cheyenne

**Dental examination. †Dental hygiene examination. ‡Write to secretary of dental examining board for information on locations of examinations. Most states require applications to be in 30 days prior to examination date.*

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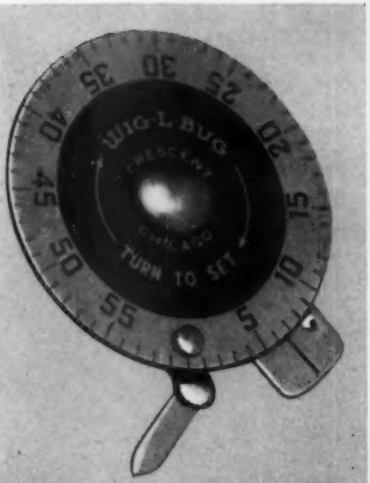

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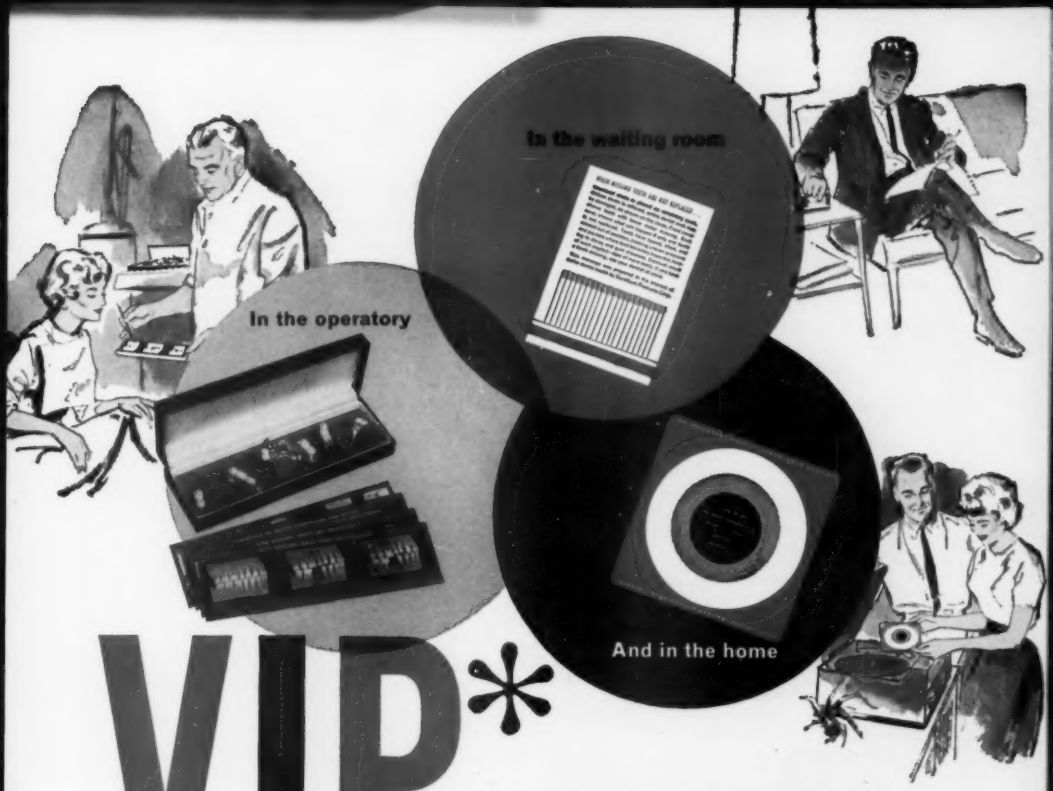
NATIONAL EXAMINATIONS

Name	*Date*	*Place*	*Secretary and Address*
American Board of Dental Public Health	Oct. 13, 14	Los Angeles	D. J. Galagan, Divn. of Dental Public Health, PHS, Dept. of Health, Education and Welfare, Washington, D.C.
American Board of Pedodontics	Nov. 28-Dec. 1	New York	R. L. Ireland, College of Dentistry, University of Nebraska, Lincoln 8, Neb.
American Board of Prosthodontics	July 25-30	Washington, D.C.	C. H. Jamieson, David Whitney Bldg., Detroit 26
Council on Dental Education, Dental Aptitude Tests	Oct. 14, 15		S. Peterson, 222 E. Superior St., Chicago 11
National Board of Dental Examiners	Dec. 5, 6		Grace Parkin, 222 East Superior St., Chicago 11

MEETINGS OF OTHER ORGANIZATIONS

Name	*Date*	*Place*	*Secretary or Chairman and Address*
Academy of Denture Prosthetics	June 19-24	San Juan, Puerto Rico	W. L. Warburton, Medical Arts Bldg., Salt Lake City 11
American Academy of Gold Foil Operators	Oct. 14, 15	Los Angeles	C. C. Latham, P.O. Box 266, Coronado, Calif.
American Academy of the History of Dentistry	Oct. 14	Los Angeles	M. B. Asbell, 25 Haddon Ave., Camden 3, N.J.
American Academy of Oral Roentgenology	Oct. 14, 15	Los Angeles	T. S. Grant, University of California Medical Center, San Francisco 22
American Academy of Pedodontics	Aug. 28-31	Boulder, Colo.	J. H. Simmons, 5225 W. Freeway, Fort Worth, Texas
American Academy of Periodontology	Oct. 13-15	Santa Monica, Calif.	H. A. Hartman, 4187 Pearl Rd., Cleveland 9
American Academy of Physiologic Dentistry	June 20-22	South Bend, Ind.	E. A. Lawton, 2217 Lincoln Way West, South Bend 28, Ind.
American Association of Dental Examiners	Oct. 14, 15	Los Angeles	C. J. Schweikhardt, 20 Durand Rd., Maplewood, N.J.
American Dental Assistants Association	Oct. 17-20	Los Angeles	Mrs. E. Troutman, First National Bank Bldg., La Porte, Ind.
American Dental Assistants Certification Board	Oct. 12-16		D. Thacker, 1419 "S" St., S.E., Washington 20, D.C.
American Dental Society of Anesthesiology	Oct. 15, 16	Los Angeles	H. A. Sultz, 1275 Delaware Ave., Buffalo 9
American Dental Society of Europe	July 5-8	Edinburgh, Scotland	J. P. Molony, 110 Harley St., London W.1, England
American Denture Society	Oct. 14, 15	Los Angeles	V. L. Steffel, College of Dentistry, Ohio State University, Columbus
American Institute of Oral Biology	Oct. 8-12	Palm Springs, Calif.	M. Lewis, 2240 Channing Way, Berkeley 4, Calif.
American Public Health Association, Dental Health Section	Oct. 31-Nov. 4	San Francisco	D. F. Striffler, P.O. Box 711, Santa Fe, N. Mex.
American Society of Dentistry for Children	Oct. 14-16	Los Angeles	W. O. Young, 120 N. Capitol Blvd., Boise, Idaho
American Society of Oral Surgeons (Forty-second)	Oct. 12-15	Phoenix, Ariz.	D. C. Trexler, 840 N. Lake Shore Dr., Chicago 11
Ark La Tex Dental Congress (Eighth)	Aug. 15	Shreveport, La.	G. Poulos, State National Bank Bldg., Texarkana, Ark.



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Name	*Date*	*Place*	*Secretary or Chairman and Address*
A.R.P.A. Internationale (International Society for Periodontal Research) 16th Congress	Sept. 15-20	Vienna, Austria	S. Loos, Kolingasse 4, Vienna 9, Austria
Association of American Women Dentists	Oct. 17	Los Angeles	G. Cramer, 95 W. Broadway, Salem, N.J.
Berkshire Conference in Oral Pathology and Periodontology (Eleventh)	June 19-23	Lenox, Mass.	I. Glickman, Tufts University, School of Dental Medicine, 136 Harrison Ave., Boston 11
British Dental Association	July 11-15	Edinburgh, Scotland	J. N. Peacock, British Dental Association, 13 Hill St., Berkeley Square, London W.1, England
Canadian Dental Association	Sept. 25-28	Ottawa, Canada	D. W. Gullett, 234 St. George St., Toronto 5
Chicago Dental Society	Feb. 5-8	Chicago	K. S. Richardson, 30 N. Michigan Ave., Chicago
European Organization for Research on Fluorine and Dental Caries Prevention	June 2-5	Hamburg, Germany	A. Syrrist, Royal Dental School, Malmo, Sweden or F. Bramstedt, University, Krankenhaus, Physiol.-chem. Institut, Hamburg 20, Germany
European Orthodontic Society (Thirty-Sixth Congress)	June 30-July 5	Belfast, Northern Ireland	H. T. A. McKeag, 35 Rugby Rd., Belfast, N.I.
Federation Dentaire Internationale, 48th Annual Meeting	June 20-25	Dublin, Ireland	G. H. Leatherman, 35 Devonshire Place, London W.1, England
Greater New York Dental Meeting (Thirty-sixth)	Dec. 5-9	New York	M. Purdy, 106-A Hotel Statler Hilton, New York
Mid-Continent Dental Congress	Nov. 27-30	St. Louis	J. E. Brophy, 8013 Maryland Ave., St. Louis 5
National Dental Association	Aug. 1-5	St. Louis	E. N. Jackson, P.O. Box 197, Charlottesville, Va.
New England Dental Society	Oct. 5, 6	Medford, Mass.	W. F. O'Meara, 904 Main St., Hartford 3, Conn.
Northeastern Dental Society	June 5-8	Swampscott, Mass.	N. A. Emery, 291 Broadway, Lynn, Mass.
Northeastern Society of Orthodontists	Nov. 14, 15	Boston	D. Mossberg, 36 Central Park S., New York 19
Odontological Society of Western Pennsylvania	Oct. 25-27	Pittsburgh	H. D. Butts, Jr., Jenkins Bldg., Pittsburgh 22
Pacific Coast Dental Conference, Eleventh Triennial	July 11-14	Portland, Ore.	K. R. Jensen, 1033 S.W. Yamhill St., Portland 5 Ore.
Pan Pacific Dental Conference	Oct. 23-27	Honolulu, Hawaii	F. A. Sandberg, 280 Lewers Rd., Honolulu 15, Hawaii
Polish Stomatological Congress	Sept. 23-25	Warsaw, Poland	General Secretariat, III Polish Stomatological Congress, 18 rue Miodowa, Warsaw 40, Poland
Rhodanien Dental Congress (Franco-Suisse-Rhone-Cote-d'Azur)	July 9-12	Nice, France	J. Neagoe, 6 Rue Alphonse-Karr, Nice (A.M.), France
Swedish Dental Society	Aug. 17-20	Stockholm	T. Telander, Nybrogatan 53, Stockholm, Sweden

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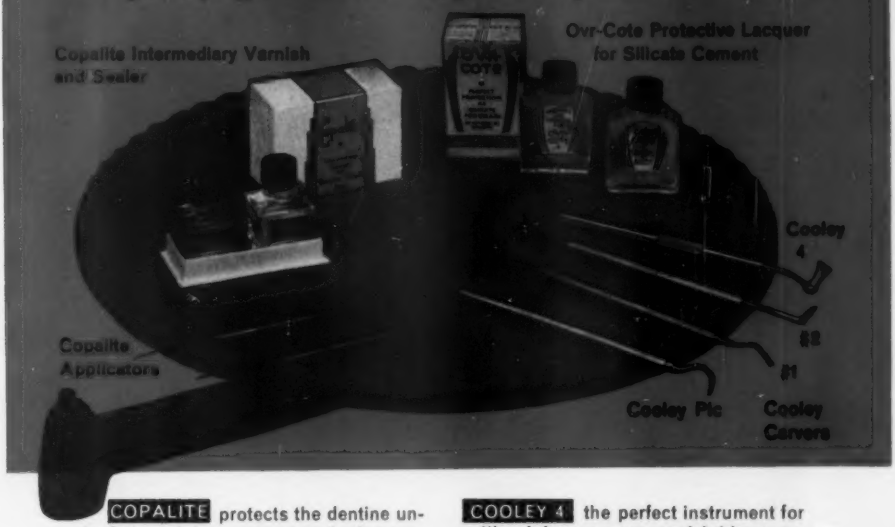

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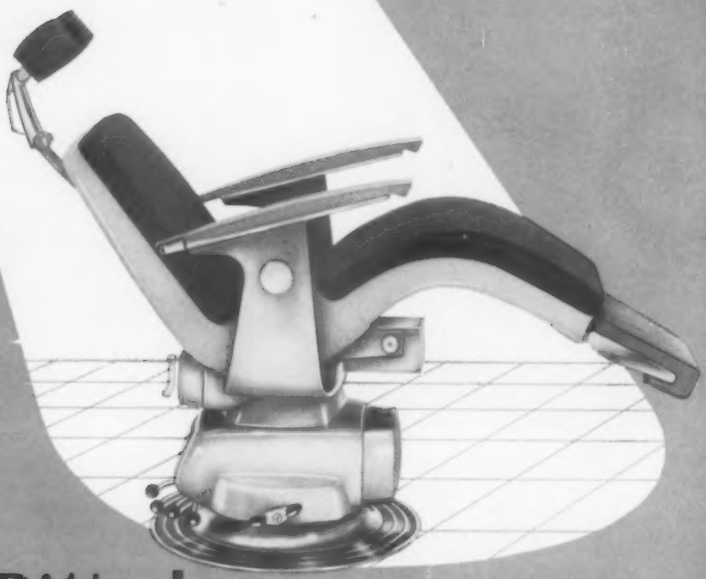

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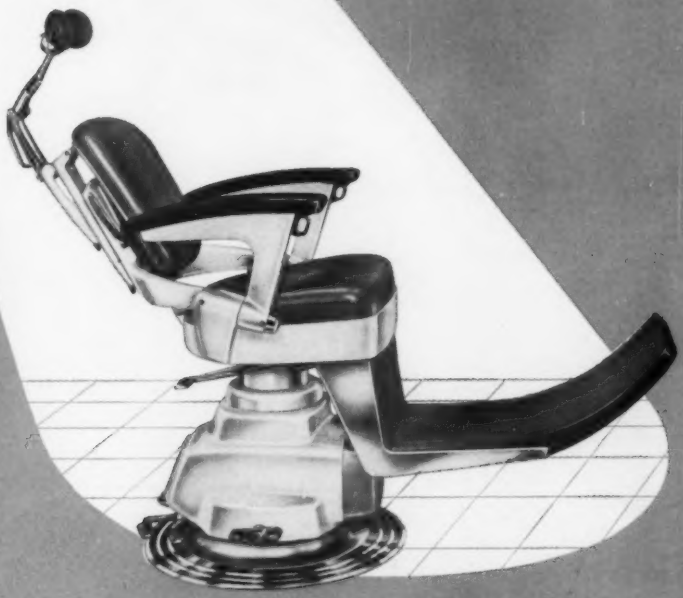

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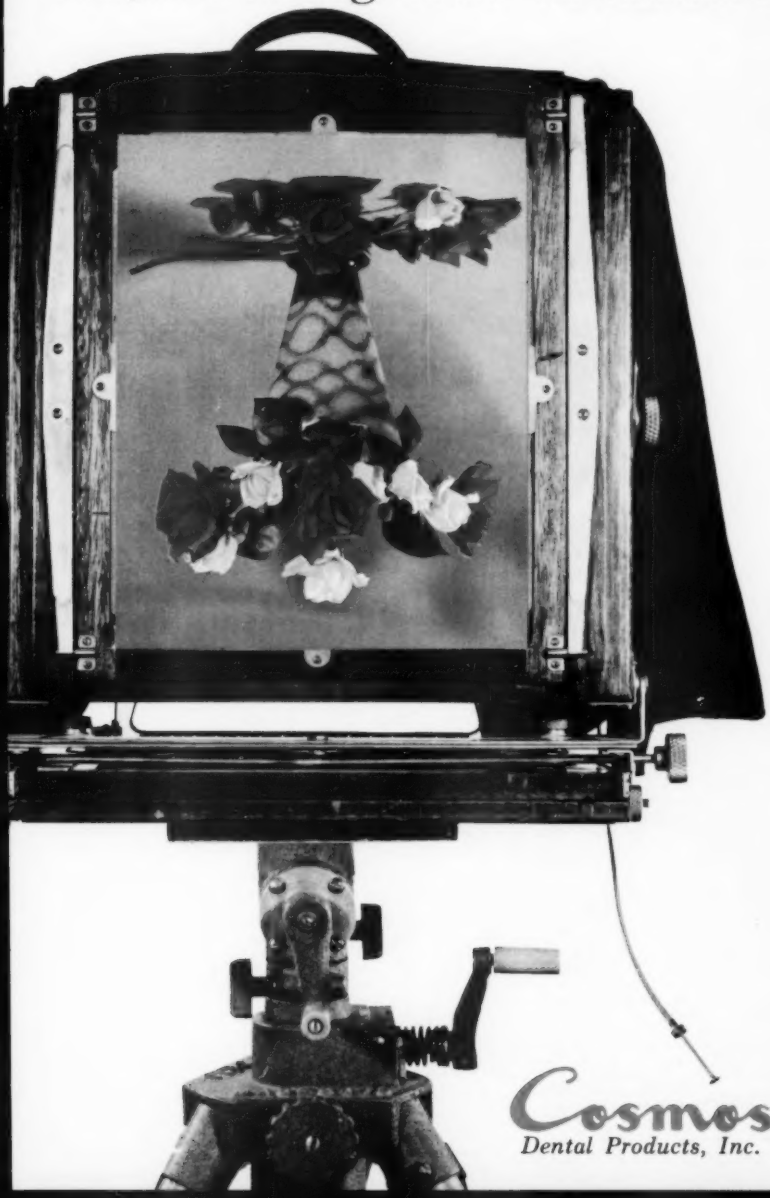

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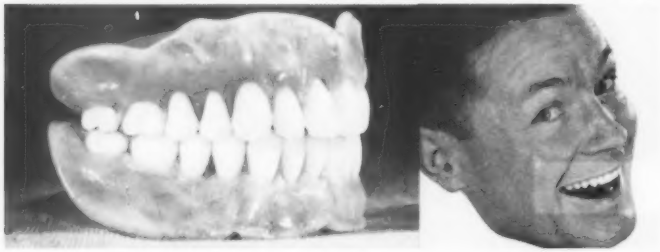

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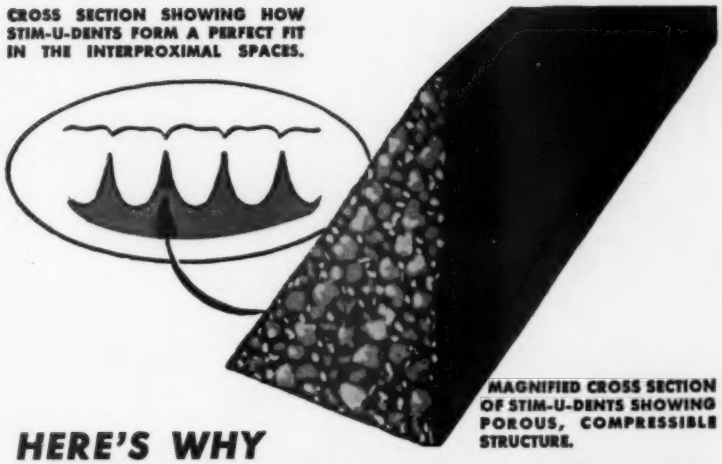

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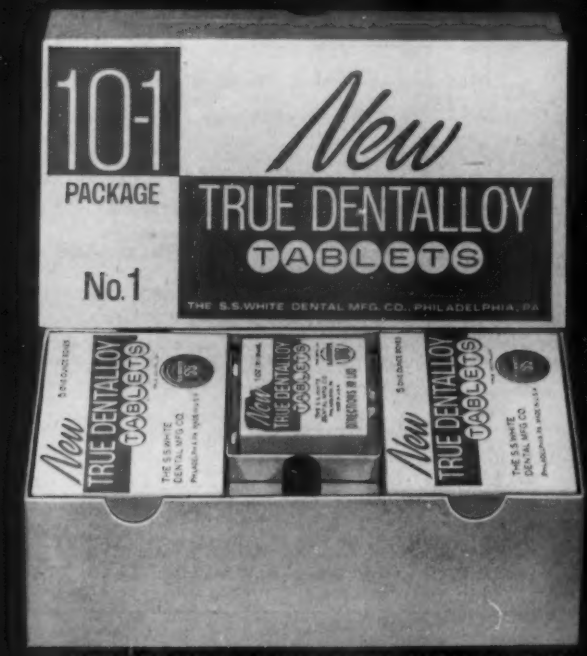

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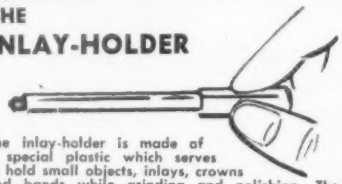

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S. Howard Payne, D.D.S.
Consulting Editor

2. Dentistry For The Handicapped

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Problem-Solving in Denture Esthetics —*Irving R. Hardy*

Vertical Dimenson, Jaw Relation Records and Occlusion—*Daniel H. Gehl*

The Try-in—*S. Howard Payne*

The Postinsertion Phase in Denture Treatment—*Richard H. Kingery*

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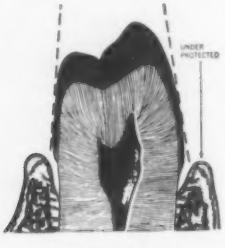
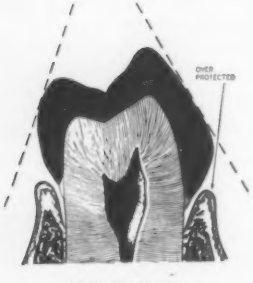
The importance of the axial or circumferential contour of cast gold crowns, however, is more often neglected. Its importance cannot be over-emphasized. The illustrations show three contours; the first under-contoured, the second over-contoured, and the third with the correct contour. The dotted lines show the manner in which food is deflected.



UNDER CONTOURED

Fig. 1



OVER CONTOURED

Fig. 2

NORMAL CONTOURED

Fig. 3

The under-contoured crown (Fig. 1), shown at left, probably causes the greatest amount of damage by affording no protection at all to the investing tissues. Both this and the over-contoured crown are definitely detrimental to the investing tissues since they result in an unhygienic condition and ultimate pathology.

The over-contoured crown (Fig. 2), shown at left, obviously affords too much protection to the investing tissues and the result will be stasis of these tissues.

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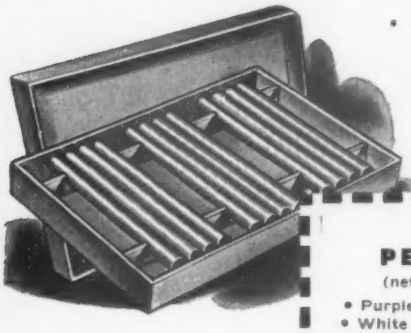

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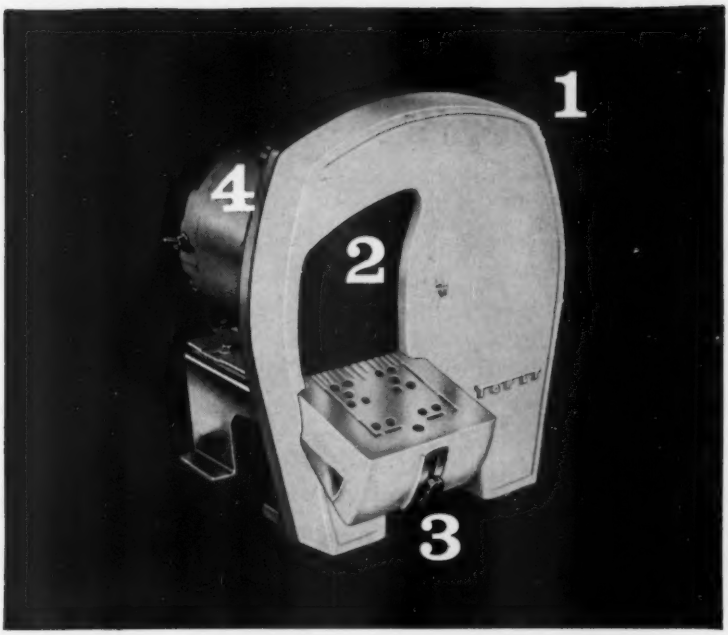

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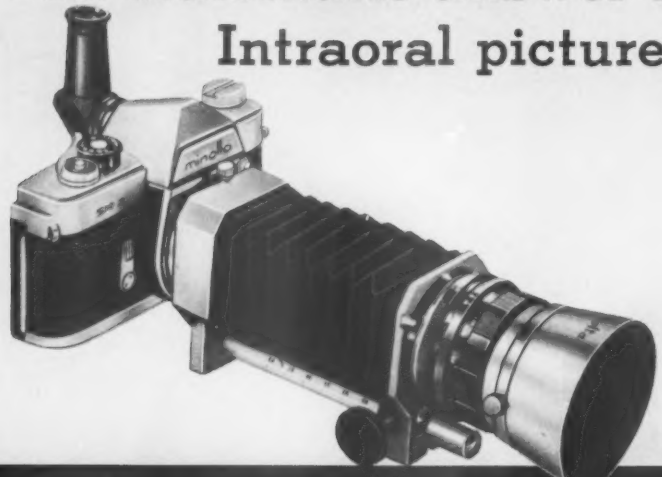

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Advance the Rapid Film Wind Lever and automatically—lens diaphragm opens to its largest aperture; film advances; shutter is cocked; frame is counted.

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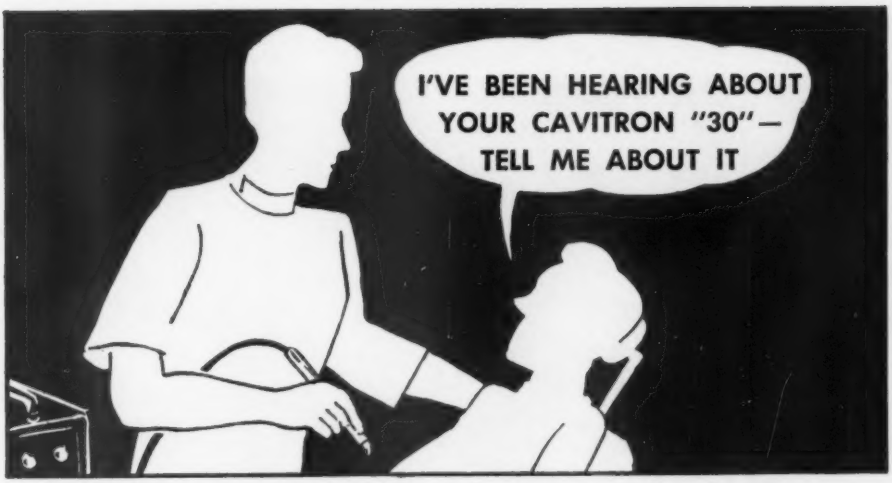

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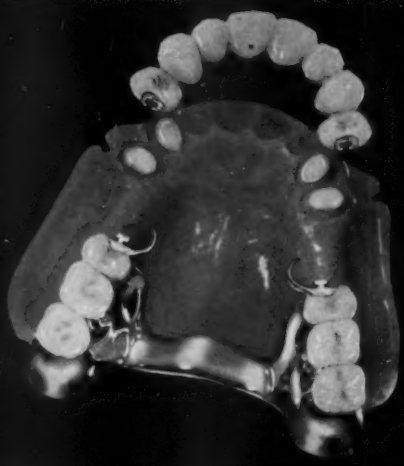
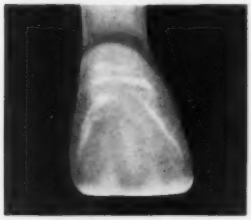
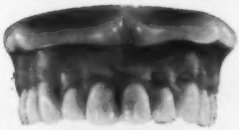
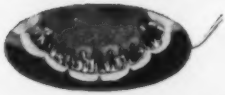


Hidden strength is built into Boos reinforced Porcelain crowns and bridges by bonding Porcelain to an individually designed strong understructure of precision-cast precious metal. The porcelain and the metal are proved materials which have the required physical properties.







Artistic skill in carving and natural color shading achieve enduring beautifully life-like individuality. In addition, porcelain may be butted to the labial shoulder.

To meet your porcelain requirements, Boos offers Vacuum-Fired and Vibra-Blend jacket and Veneer crowns in addition to Porcelain "bonded to metal" crowns and bridges. Desired esthetics are achieved through tooth contour, bilateral symmetry, precise color blending and accurate margins.

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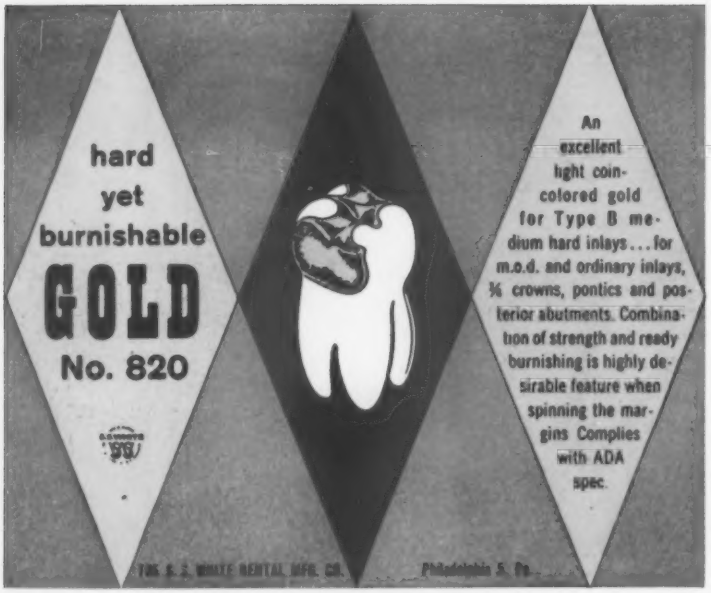
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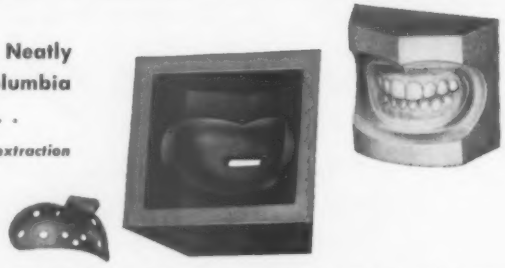

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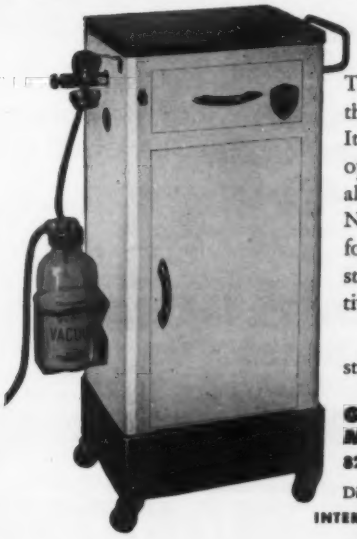

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Sarcoma of Maxilla

1. Periapical Radiograph:

Loss of normal trabecular bone pattern and replacement with an irregular and diffuse radiolucency, together with the loss of lamina dura and the complete resorption of alveolar bone on the distal as well as the periapical regions of the molar are findings suggestive of a malignant neoplasm. The final diagnosis, that of sarcoma, was conclusively established by biopsy.

2. Occlusal Radiograph:

Note the better visualization of the findings indicated above in Figure 1. It involves a more widespread area portraying the "honeycombed" appearance.

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3. Extraoral Radiograph:

A more comprehensive view of a case of sarcoma of the maxilla. Note the widespread involvement by the malignant neoplasm —only a portion of which could have been observed in a periapical or occlusal radiograph. (This case of sarcoma, however, is different from that depicted in Figures 1 and 2.)

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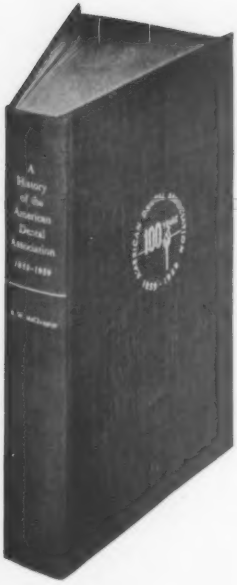

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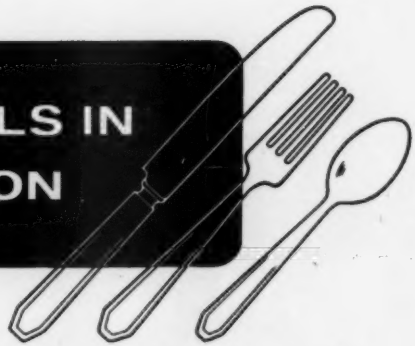

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The nutritional statements made on this chart have been reviewed by the Council on Foods and Nutrition of the American Medical Association and found consistent with current authoritative medical opinion.

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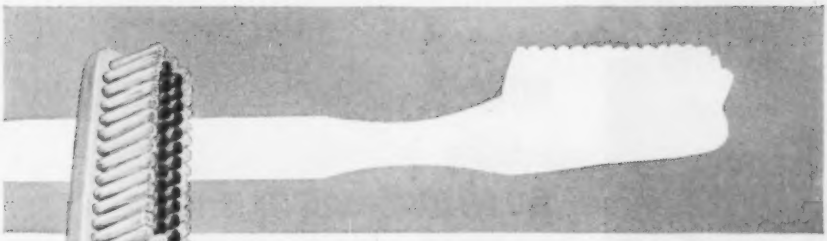

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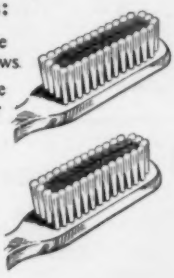

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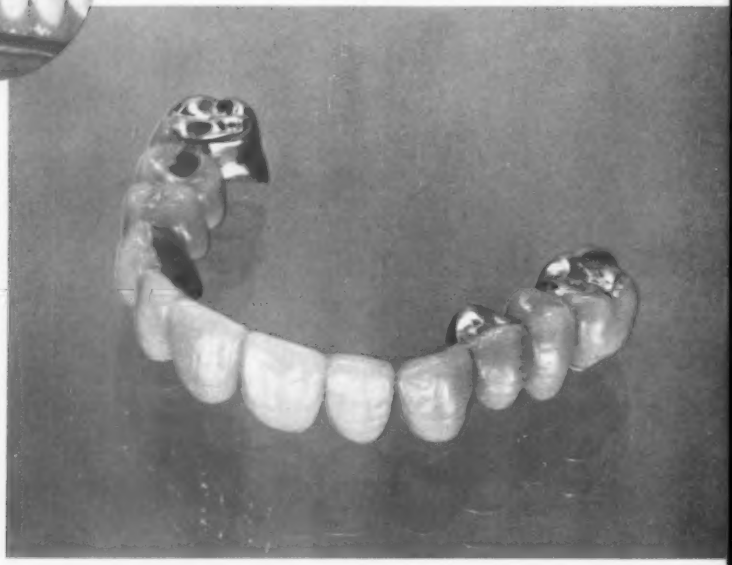

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Micro-Bond is very versatile—from a single reinforced crown to full mouth rehabilitation, Micro-Bond porcelain fused to palladium precious metal provides the strength and accuracy for such wide application.

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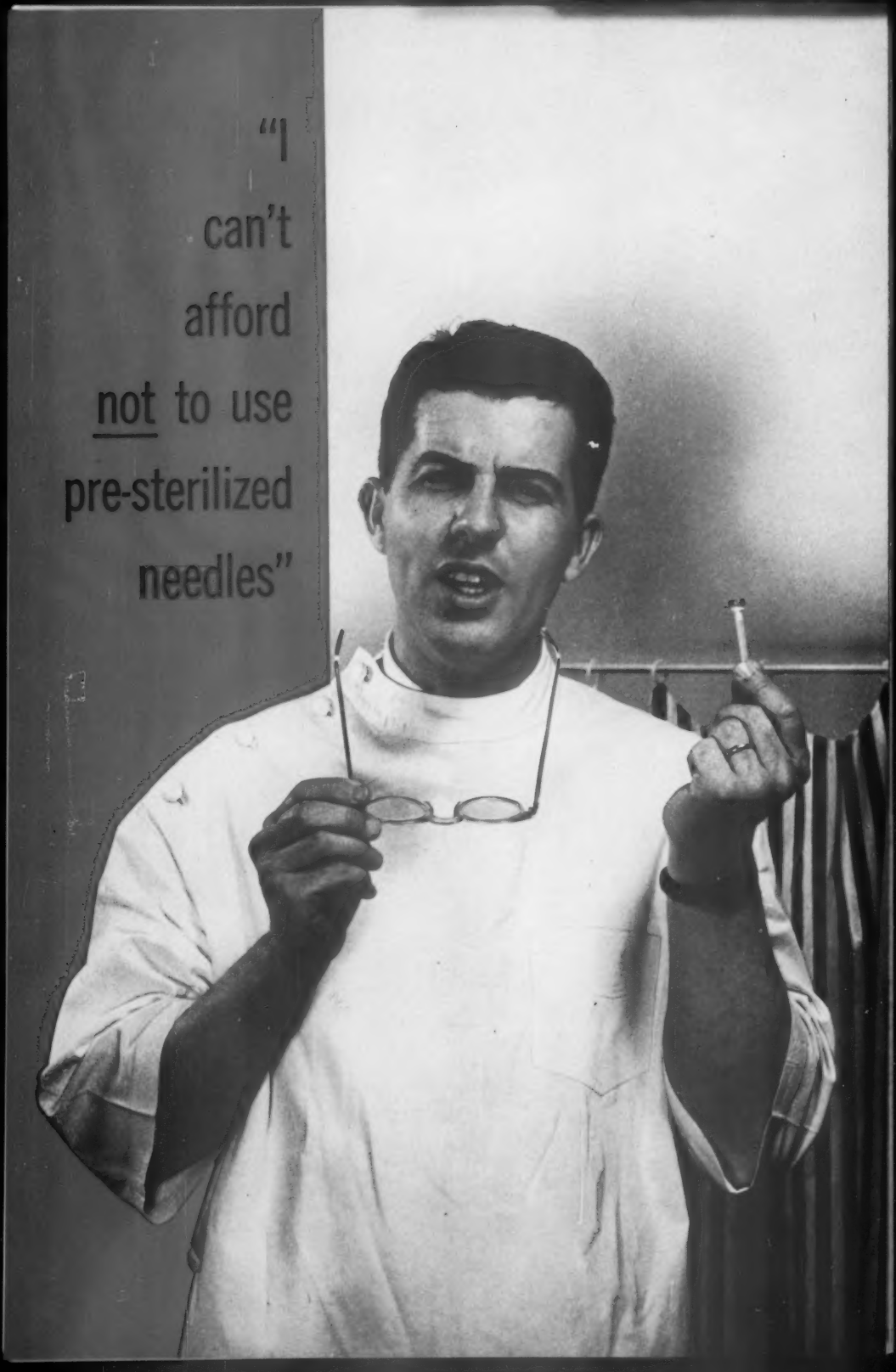
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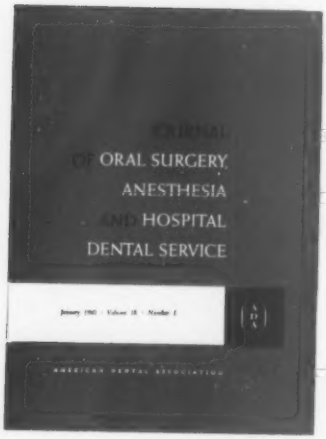

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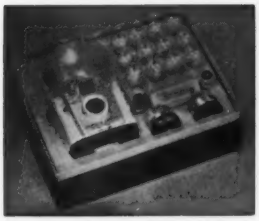

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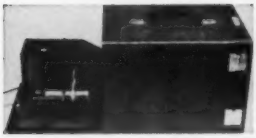

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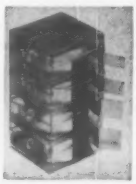

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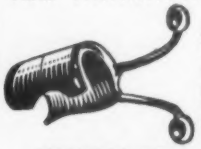

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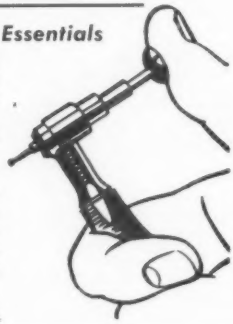

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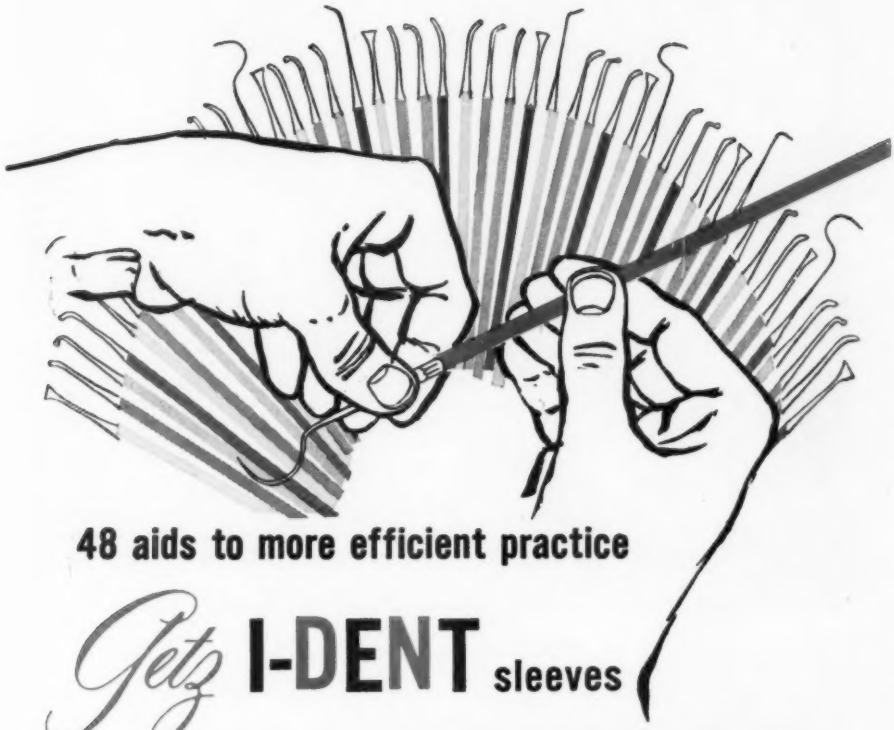

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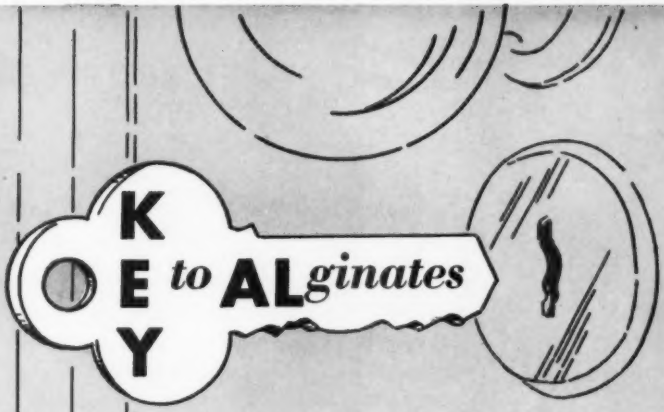

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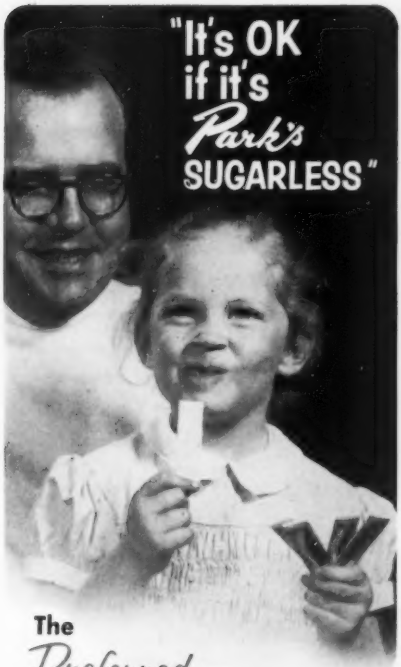

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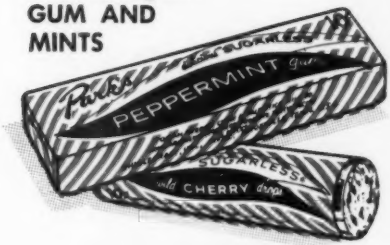

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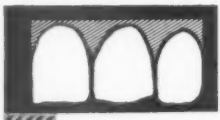

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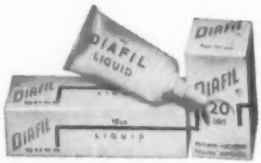

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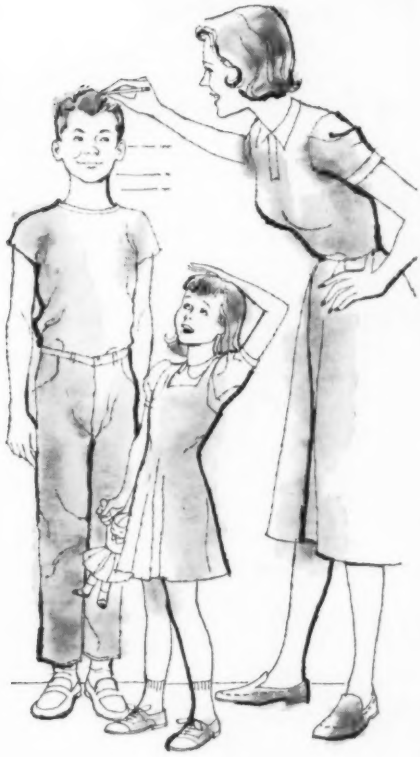

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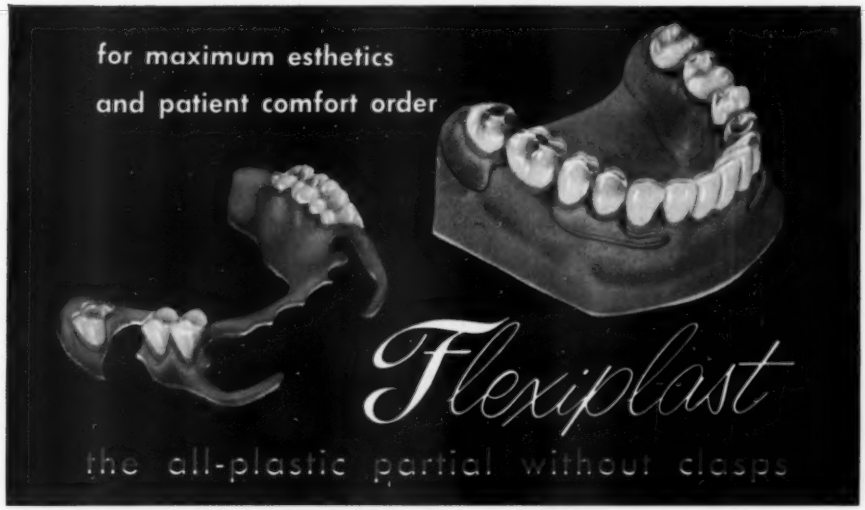

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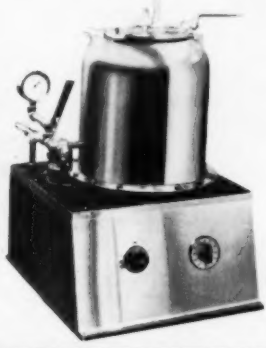

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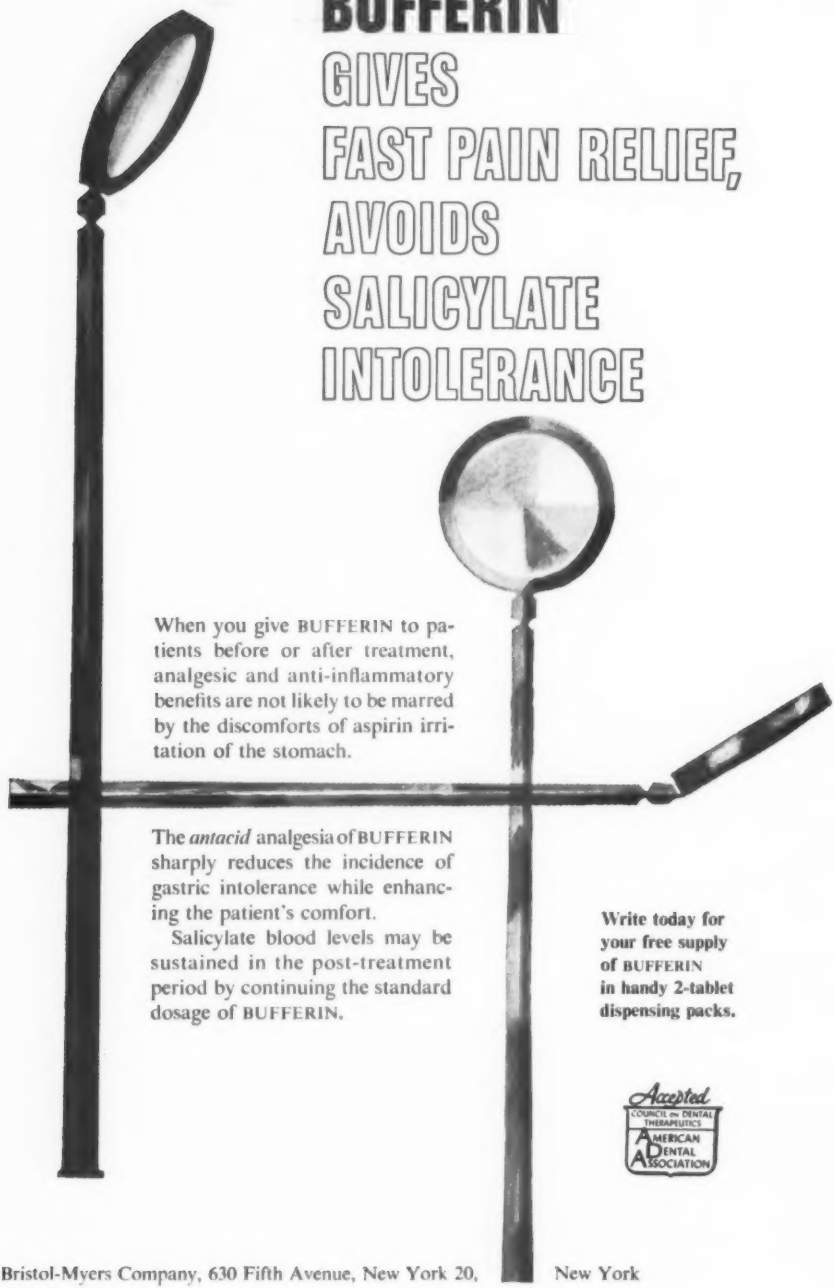

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